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MARCH 1961

THE MAGAZINE OF AUTOMATIC OFFICE METHODS AND MANAGEMENT

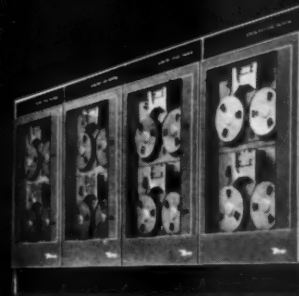
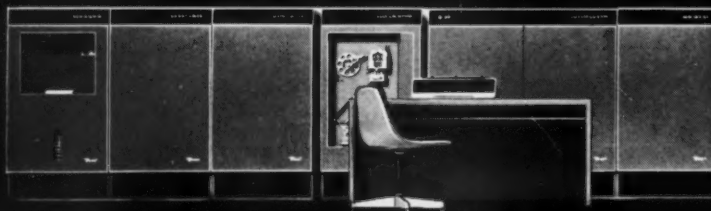


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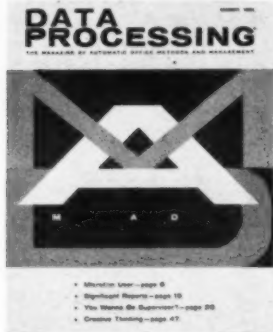
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Volume Three • Number Three



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MARCH • 1961

OBSERVATIONS...

from the publisher

When Will You Have a Computer?

IF your firm doesn't already have one it appears to be a dead certainty that you will have a computer within the next five years.

Computer manufacturers estimate that by 1965 more than 45,000 computers of all sizes will be in operation.

Management men at both the departmental and higher levels are facing this type of prediction with some trepidation. Most of this apprehension stems from a lack of understanding of the functions performed by high speed computing systems. Prospective users are often stunned by the unfamiliar terminology surrounding these systems, which tends to obscure the operational benefits.

Others fear the possibility of failure and are reluctant to take the first steps toward success.

The possibilities of personnel displacement, or individual inability to adjust to a new approach, are other factors that deter investigation of computer systems.

Your organization may not be ready for a computer at this time for a number of valid reasons. However, base your judgment on facts. Wipe aside the awesome image of "giant brains" and complex terms and make a realistic appraisal of your situation so that you will be ready for a computer when the competitive position of your firm warrants such an installation.

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AUTHORS

RICHARD S. SLOMA (*Management Alarm Digits*) is responsible for the Cities Service Oil Company data processing installation and its development. He has chosen, trained and developed 10 methods research-programmers to work with the IBM 7070 and 1401 to fully bring his total systems concept in Petroleum Marketing Accounting tax into existence. Formerly he was senior systems representative for IBM, and designed the system for Cities Service. He has a Sc. B. degree from Northwestern University and has held positions of systems analyst, IBM methods analyst, business systems research analyst, office manager and assistant general manager in various industries. He has spent five years in electronic data processing systems, and a total of ten years in systems work.

His goals for a total electronic data processing effort at Cities Service extend beyond data processing and include operations research applications such as sales forecasting, inventory scheduling, routing, econometrics, etc. He is working on a master's degree in Operations Research at the University of Chicago.

DON TITUS (*Significant Reports*) was educated at Stanford on the West Coast. His background includes two years with Standard Oil in Venezuela, ten years with the United States Trust Company of New York and a two and a half year stretch in the Army during World War II. Since the war, he has been in the consulting field and with the Research Institute of America. With the Commission on Fiscal Affairs for the State of New York in 1955, he handled the income tax phase of this project.

He is currently with American Cyanamid Company, handling special projects for the Administrative Standards Department. For several years he has specialized in the study of management reports.

As a member of the Systems and Procedures Association he has served as Chapter President and National Director. He has written numerous articles on the systems field.

DOUGLAS D. HUBBARD (*You Wanna Be Supervisor*) is an Administrative Staff member and Data Processing Supervisor for The Cowlitz County Public Utility District No. 1 of Longview, Washington. He attended Pacific Lutheran University in Parkland, Washington and has served in the data processing field for fourteen years. Mr. Hubbard was associated with The Long-Bell Lumber Company in Longview, Washington from 1947 to 1951 in research and machine accounting. In 1951 he directed the conversion from manual methods to punched card procedures at The Cowlitz County Public Utility and has been with the District since, except for a period in 1956 when on leave of absence, he supervised the conversion to punched card accounting for The Oregon Mutual Savings Bank in Portland, Oregon. He is a member of the Portland Chapter of the National Machine Accountants Association and has had articles on data processing published in professional and business journals.

VAN THOMPSON (*Creative Thinking*) attended Simpson College, Franklin College, and Indiana University. A Korean War veteran, he entered the data processing field upon discharge from the army in 1953, as an IBM operator-trainee at Arvin Industries, Inc., Columbus, Indiana.

In 1956 he was employed by Cummins Engine Company, Inc., also of Columbus, as a senior punched card and 650 console operator. He left Cummins in 1957 and has since been engaged in organizing and teaching training courses in business data processing at a government facility.

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Since the recent installation of the Thermo-Fax "Filmac 100" reader-printer, Auchincloss, Parker and Redpath has cut reproduction costs 90%. Bob Anselmo, APR employee, quickly and easily views an investor's monthly statement. A reproduction of this record can be made in 10 seconds — a valuable aid to the company as well as an extra service to customers.



Microfilm User

Investment firm reduces costs with reader-printer.

INCREASED PAPERWORK, coupled with reproduction and filing of records, has sent a prominent investment firm into the microfilm field for relief. Although Auchincloss, Parker and Redpath began using microfilm 13 years ago to duplicate and store records, it was the recent introduction of the Thermo-Fax Filmac 100 — a table model reader-printer which can reproduce a paper copy from microfilm in 10 seconds — that enabled them to establish a system which saved time, money, and was a service to its 30,000 investors.

Auchincloss, Parker and Redpath are members of the New York, American and Philadelphia-Baltimore Stock Exchanges, Chicago Board of Trade and Chicago Mercantile Exchange, with thirteen offices in New York, New Jersey, Connecticut, Pennsylvania, Washington, D. C., Maryland and Virginia.

Paper files had been stored in a sub basement of the New York office, making storage, retrieval, reproduction, and refiling costly and time consuming. Each year APR used 20 legal size filing cabinets to store just monthly statements. Records were kept for seven years, as required by the statute of limitations, then destroyed.

At year end this paper material was removed from the 20 filing cabinets and placed in about 30 trans files. With this system the seven year period used about 200 files.

Under the present system, APR microfilms all records on 16 mm. roll film in their offices. These 800 rolls are stored in one filing drawer, requiring little space in a small room. Because permanent records are now maintained on microfilm, statute of limitations for paper copy has been lowered to two years in most cases. Thus, storage space has been drastically reduced.

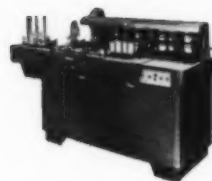
Reader-printer cuts costs

Previously when APR had only roll microfilm from which to work, it cost approximately 80 cents to obtain a paper reproduction of the microfilmed record from an outside supplier. Today, with the "Filmac 100", that same reproduction can be made for *eight* cents — and in a far shorter time than was formerly possible.

Further advantage comes from the fact that not only are all records now kept in the office, but reproduction, with the "Filmac 100", is now done on the premises and not at a supplier's as was previously the case. Monthly statements, government requests, customer and company checks are all immediately available and immediately reproducible within the New York office.

This is an extra service to investors needing assistance in tracing checks, replacing lost records or filing income tax returns. The "Filmac 100" is also used by U. S. Government agencies such as the Bureau of Internal Revenue, in checking income tax returns, and the Security Exchange Commission, in reviewing company records. Routine business procedures have also been speeded up by the use of microfilm and the reader-printer. Today APR prepares monthly statements in duplicate. The original statement is sent to the investor and the carbon copy is microfilmed and kept on the premises for the myriad requests which the company receives. Thus, the company is in a position to produce immediately a valid copy of all accounting documents required — all within ten seconds.

Auchincloss, Parker and Redpath has found that its investment into the microfilm and reader-printer system is a time, space and cost saving. It has not only benefited its own organization, but also been an added service to its investor-customers. ■



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A midwestern insurance company sets a dramatic example for users of data-processing equipment

The Hardware Mutuals - Sentry Life insurance group is using a new data-communications system to speed data handling by 500 per cent and reduce operating costs by over a million dollars a year.

The new system makes use of the nationwide Long Distance telephone network. It combines the Bell System's new *Data-Phone* service with data processing equipment to send business records from 32 branches to the company's centralized computer center at Stevens Point, Wisconsin.

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The system is as flexible as the telephone network itself. The insurance company pays for telephone circuits only when using them, as for any branch-to-headquarters call. And Data-Phone takes up little more space than a standard typewriter.

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Learn how high-speed, low-cost Data-Phone service can streamline your company's data processing. Just call your Bell Telephone Business Office and ask for a Communications Consultant. He'll bring you the complete story.



James P. Jacobs, President, Hardware Mutuals - Sentry Life insurance group, says:

"Our new data-processing technique—with the rapid communication of data made possible by Data-Phone—is benefiting our business in many important ways.

"It lets us collect the mass of information we need for management decisions almost instantly. It has cut the time needed for certain policy-handling functions from three days to three minutes. It is reducing our operating costs by over \$1,000,000 a year and is helping us give our policyholders better service than ever before.

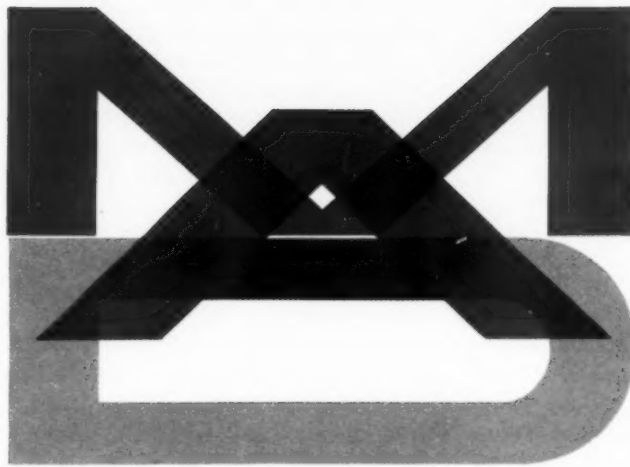
"Naturally, we're enthusiastic about it."

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BELL TELEPHONE SYSTEM



By Richard S. Sloma

Management Alarm Digits

Let's go MAD with reports to management.

SOME FOUR TO FIVE YEARS AGO, the pressing need for qualified people in the electronic data processing field was for technical, highly machine-oriented specialists — the men who could debate the millisecond problem “inside” the computer casing. As computer manufacturers expanded their training facilities and customers more and more used those facilities and conducted their own training classes, machine technology know-how sprinted forward at an accelerated pace. It became increasingly clear that technical advances were outdistancing efficient application. Inevitably, the day of the systems man dawned and waxed toward high noon finding him involved in data processing implementations, yielding the magnetic tape data files now in existence in many firms.

It is becoming increasingly clear today that the need for systems men is fading into the twilight and a new breed, commonly known as *management science specialists*, has entered upon the scene. This is not to say that either machine-men and/or systems-men are no longer needed. Quite

the contrary is true. These men and more like them will continue to be needed. What is meant here, is the prime need for people who are instrumental in assaulting frontiers. The impetus of development now lies spectacularly in the management science field. Certainly, new machine technologies will be inherited by systems and management science specialists, but it is the applied technologies which will bear the most bountiful fruit to our entire society — the management science applications. Just as the systems man stood upon the shoulders of the machine men, so now the management science people use the cumulative efforts of the systems men as a platform upon which to build a new technology — a new career potential. The end result of the machine man efforts has been efficient techniques for data handling. The systems man used these techniques for efficient systems design culminating in data processing — the establishment of accurate, accessible magnetic tape data files. The management science man now takes

(continued on next page)

these data files and generates management information.

Data processing, envisioned as efficient use of magnetic tape computers, results in short term economies by eliminating clerical jobs. Information processing, envisioned as efficient management science applications, results in much more encompassing economies for a firm by assuming more and more of the management function. One may even go as far to say that in a competitive market, the literal survival of a firm rests upon efficient management science utilization of computers, particularly if the firm's competitors are actively engaged in such efforts.

Overwhelming abundance

The inevitable result of a sound systems design is the improvement of reporting schedules to the point where virtually all reports are reduced to hard-copy within a period of one or two days. Although at first glance it appears that this improvement is manifestly good for the firm, a further look unearths a serious problem for the firm, namely that management personnel is deluged in data.

Management personnel must yet read, study, digest and distill out management information from this abundance of data. It is on an evaluation of management information that management decisions are formulated. Thus, with a top-drawer systems approach we can expose our firm to a dangerous condition. We can supply data that much more quickly so as to force management to delay acting on that data until they digest all of it.

In other words, the dilemma appears to be either preparing all data reports so fast as to deluge management with data or not improve reporting and allow management time to digest data piecemeal. There is a solution to this dilemma, however,



which provides for as early reporting as possible, yet also relieves management of the burdensome and time-consuming task of studying all data. The solution lies in the principle of *management by exception*.

The purpose of this paper is to present an approach to this most practical and pressing problem facing the management science field: the problem of implementation of the principle of management by exception.

Management by exception generally implies the notion of not printing hard-copy reports describing those business phenomena which are considered normal. Only *abnormal* business performance is reduced to hard copy for management scrutiny. In theory, the idea is fine, but in practice it is most difficult to achieve because management almost invariably desires all data in hard copy for ready reference.

Criteria

Before presenting a solution, let us first adequately describe the problem. All areas of management are concerned with knowledge related to only two measures. These criteria are:

1. Variance of actual performance from some predetermined standard, and
2. The extent or seriousness of the variation.

The question of *standard* can be resolved in several ways. The most common measure of reference used is prior year. That is, "How does this year's performance compare to last year's?" Variances, then, from last year's performance trigger the alarm.

The second most used criteria is comparison of actual performance to a plan, budget, forecast or standard. In this case, variances are measured from the plan, budget, forecast or standard.

It is the author's judgment that the latter criteria are to be preferred for two reasons:

1. Given, say a 10% increase over last year, this figure tells management little because it is still undetermined whether performance should have been 35% over last year or 20% under last year. The "should have been" figure is the important management measure.
2. Current developments in linear and non-linear programming techniques provide more rapid and accurate determination of forecasts and plans. This potential must be exploited for ultimate profit maximization.

These two areas of information (*as opposed to data*) are of prime interest to all management functions. It matters little whether we are concerned with sales management, production management, accounting management, etc. Truly effective management establishes standards or improves those which it inherits. The job of quan-

tifying performance and applying the yardstick is the responsibility and the end result of a thorough, conscientious management science approach.

A truly professional EDP management science approach must proceed beyond data processing. It should be assumed that data processing will be accomplished in the most economical manner. A management science approach must assume as great a portion of the management function as possible. It is now possible, through EDP, for a management science approach which does, indeed, begin to conserve management time invested in report scrutiny.

Management time spent in report study and perusal can quickly become an expense rather than an investment. At month end, management is deluged with reports. It is a most time consuming task to wade through the numerous sheets and cull out management information. A comprehensive systems approach must provide management not only with data, but with information as well. EDP affords the opportunity as well as the responsibility to provide management with reports which pin-point discrepancies and provide ready reference data with equal facility and economy.

The normal EDP approach is to up-date a master file with transactions on a daily, weekly or periodic basis during the month. At month end, the up-dated master is usually combined with comparative and plan data to prepare a report tape. The report tape is taken off-line to a printer for preparation of the hard copy report. The time to go "MAD" with reports is during the run which prepares the report tape, because this is the time when report line information is available in memory for management type evaluation.

Management alarms

How does the "MAD" idea work? First of all, refer to *Exhibit I*, which shows a hypothetical sales report with preprinted row labels and column

headings. Virtually all reports to management look very similar to this exhibit in that they display vertical columns and horizontal rows, regardless of the headings. The importance of this common characteristic cannot be easily overestimated. The presence of columns and rows means that each figure appearing on the face of the report can be located or identified by one and only one row and column intersection; it has one and only one unique *address*.

For instance, in *Exhibit I* the address "A-03" refers only to the "percent this year to last year" figure for product line 03. Assume that the percentage figure calculated during the report tape preparation run varies from the standard or *plan* figures. By printing the address of the variance from *plan* on the face of the report, say in the upper right-hand corner, we can advise management easily that a variance from *plan* has occurred. It is thus possible to meet criteria one listed above.

This notification to management falls short of the total MAD objective for two reasons:

1. We have not yet told management of the extent or seriousness of the variance. In short, we have failed to meet criteria two listed above.
2. Actual performance will almost always vary from a *plan* so we would be forced to print virtually all of the addresses of the form which would be unproductive.

Somehow, we must measure or quantify the extent of this variance. We must establish a yardstick with which to gauge the variance. There are generally two approaches which can be taken toward the establishment of these measures.

First, we can go to management and ask "When does variance from *plan* become significant? At three percent? Five percent? Ten percent?" Historically, such an approach has proven to be rather time-consuming because management is faced with problems for which there really are no ready answers. This approach is the more inexpedient.

EXHIBIT I

PRODUCT SALES ANALYSIS										
	THIS MONTH				% THIS YEAR TO LAST YEAR		PLAN		% THIS YEAR TO PLAN	
	THIS YEAR		LAST MONTH		UNITS (A)	REVENUE (B)	UNITS	REVENUE	UNITS (C)	REVENUE (D)
PRODUCT	UNITS	REVENUE	UNITS	REVENUE						
01										
02										
03					A-03					
↓ n										

Weighted significantly

The author favors the approach that the systems department set up the significance weights initially and then, after experience is gained, these weights can be changed by management decision with a minimum of patch-programming. Naturally, the more familiar that the systems analyst is with the data, the more realistic will be the weights assigned.

For illustrative purposes, let us assume the following significance factors:

Variance	Alarm Digit
<± 5%	None
± 6%	0
± 7%	1
± 8%	2
± 9%	3
±10%	4
±11%	5
±12%	6
±13%	7
±14%	8
>±14%	9

To continue with the example cited previously, assume that the following conditions exist:

Address	Extent of Variance
A03	- 7%
B01	+ 9%
B03	- 2%
C02	-10%
D03	-18%

These conditions would be displayed as shown on *Exhibit II*.

A glance at the upper right-hand corner shows quite clearly the effectiveness of this MAD idea because the Management Alarm Digits can be read by the manager's secretary, for instance, with a minimum of instructions and arranged by her in

alarm sequence; that is, all reports with an alarm digit of "9" first, followed by all reports with an alarm digit of "8", "7", etc.

This procedure provides a manager with the reports in which he will be most interested on the top of the stack of hard copy, and will also pinpoint the exact figure that caused the alarm to be sounded. The manager knows that as he proceeds through the reports, those remaining possess decreasing variance significance.

Additional or different coding can differentiate between plus and minus variance, if management so desires. Combinations, such as alphabetic symbols for plus variances and numeric symbols for minus variances, can be used.

Any type of report is susceptible to this MAD approach. Properly designed accounts receivable statements, for instance, can be used as credit management reports if variances from purchase, pay and/or product patterns set off management alarms.

In accounts receivable use, the MAD approach will vary from previous examples to better serve this specialized management. Individual figures appearing on the face of the statement are not the prime reasons for management action. Hence, they should not be brought specifically to management's attention.

Of paramount importance is behavior pattern of the account. Specifically, behavior pattern in three areas:

1. Payment pattern: Does the account usually pay statement, current, 30-day balance, 60-day balance, invoice and so on. Payment pattern should be coded and the previous 12 months' behavior shown on the face of the statement for management reference.

EXHIBIT II

PRODUCT SALES ANALYSIS										
	THIS MONTH				% THIS YEAR TO LAST YEAR		PLAN		% THIS YEAR TO PLAN	
	THIS YEAR		LAST MONTH		UNITS (A)	REVENUE (B)	UNITS	REVENUE	UNITS (C)	REVENUE (D)
PRODUCT	UNITS	REVENUE	UNITS	REVENUE						
01						B01				
02									C02	
03					A03	B03				D03
↓ n										

2. Purchase amount pattern: How much does the account usually purchase per month? Purchase amount pattern should be coded and, at least, the previous six months' behavior shown on the face of the statement for management reference.

3. Product purchase pattern: Which product or group of products are most frequently purchased? Product purchase pattern should be coded and the modal product (*group*) shown each month on the face of the statement for management reference.

Variations in account behavior pattern should occur with the same relative infrequency as changes in human behavior patterns. Thus, the systems approach should not attempt analysis of the variation but should sound the alarm that a variation has occurred.

One way of sounding this management alarm is to allow for four digit positions in the upper right hand corner of the statement, using only the numbers 0 and 1. Zero, of course, indicates that the alarm is *off*; a 1 indicates that the alarm is *on*. As an example:

1	0	1	1
			Indicates that the credit limit has been exceeded.
			Indicates that product purchase pattern has changed.
			Indicates no change in purchase amount pattern.
			Indicates that payment pattern has changed.

Again, it is possible for clerical personnel to sort statements in alarm sequence, insuring that the credit management personnel deal first with those accounts which have changed patterns and that, again, as the manager proceeds through the stack of statements, he is assured that those remaining are of lesser or even no pattern change; yet, he is provided all data in addition to management information.

In summary, this MAD technique provides:

1. Truly effective management scrutiny of reports.
2. Complete, encompassing data detail.
3. Pinpointing of variances from planned or anticipated behavior.
4. Measurement of significance of these variances.
5. Maximum conservation of management time.

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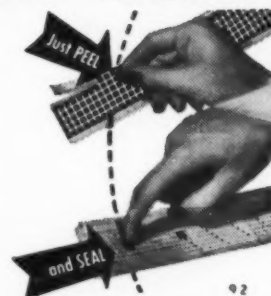
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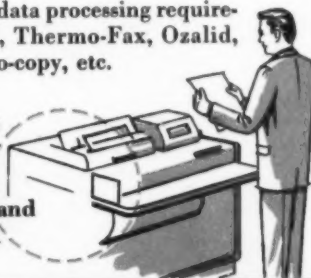


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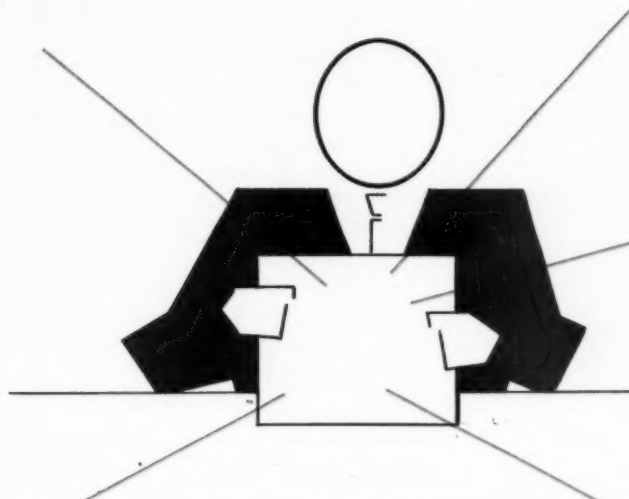
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Significant Reports

Evaluation of a corporate information system.

MOST COMPANIES TODAY do not have an adequate information system, even if they are fortunate enough to have qualified manpower to properly use a scientific and integrated structure of reports. So important is the right kind of information to a company's growth and profits that an evaluation of the material used for making decisions will almost always have gratifying results. At the very least, it will disclose areas where too much or too little information is being received, where distortions are inadvertently created and where more time than necessary is spent in the analysis of poorly presented facts and figures.

Most people will agree that the best reports are those best suited to the purposes of people who must use them. These reports are not necessarily more or less timely, or more or less detailed, but contain with the least possible distortion the significant facts and figures on which action can be taken. Merely to raise certain questions will usually stimulate improvement in this area.

In recent years a somewhat illogical attitude towards reports seems to have overtaken management, particularly where electronics has entered the picture. It seems that electronics, through some sort of magic, is going to take care of all management's information needs. Such an attitude is unsound and can lead to some disappointing results. There is no magic in electronics as far as reports are concerned. The development of a good information program, in fact, should precede any attempt to install a data processing system.

Managerial responsibility

During the past decade there has been a general and rapid trend towards more scientific management. This trend has been given impetus through a better recognition of mathematical techniques

applied to administrative problems. It may be that the executive of tomorrow will no longer be judged by the decisions he makes with incomplete and possibly distorted data, but by his ability to obtain and use scientifically a minimum amount of critical information.

As managers reach higher levels, the volume of their reports grows, sometimes to the point where necessary action is deferred until the manager has had time to complete his analysis. It is a primary responsibility of each management level to isolate the critical elements of performance and profitability as rapidly as is necessary for accurate decision making. It follows that each level of management should make certain it receives re-

By Don Titus



ports which will highlight significant facts in such a way as to best conserve its time.

At the higher levels of management it should be unnecessary for the report reader to have to analyze, compare and compute to dig out the real meaning of facts and figures. But it is only through each manager's own definition of his requirements that he will receive the best reports on which to base his decisions.

Recommended procedure

Reports fall within everyone's province and are the most expensive form of communication a company has. However, if any real gains are to be achieved, the problem cannot be attacked as another cost reduction drive. Arbitrarily discontinuing reports of questionable value will result only in temporary benefits at best.

The steps involved in a report evaluation survey are as follows:

- a) Secure an inventory of reports from each segment of the business, such as a complete operating unit.
- b) Classify the reports according to how they fit into the organizational structure, whether operating or financial or forecasting, how many copies are made, recipients, etc.
- c) Determine the significant elements of reporting needed by each level of management for making decisions and taking action. Critical factors controlling profitability should be isolated and the means to report them in proper perspective should be developed if they do not already exist.
- d) Develop a cost range for the preparation of each report, and if possible an estimated value, based on criteria outlined in this article, as well as specific criteria that should be developed. The practice of costing reports and evaluating their worth should be encouraged. When confronted with a price tag on a report, most people will stop to analyze its value.
- e) Establish comparative standards in appropriate areas if this has not been done. Reports on measurable units of time and work related to objectives can be very effective in managerial control, and in providing to both supervisors and individuals an incentive for above-average accomplishments.
- f) Recommend new reports and additions to current reports based on criteria developed with each level of management.
- g) Recommend discontinuing reports, portions of reports and copies where they do not meet the standards developed. Many reports, in whole or in part, may be eliminated for one or more of the following basic reasons:
 - 1) The information contained in the report is available in another report

- 2) It is useful only on a special, rather than routine basis
- 3) It is unnecessary from a management point of view.

h) Analyze the overall structure for these typical shortcomings:

- 1) Lack of integration
- 2) Mixture of planning and control data
- 3) Lack of timeliness
- 4) Duplication of effort
- 5) Too much or too little information
- 6) Too wide distribution
- 7) Lack of clarity
- 8) Incompleteness.

Evaluation aid

It may be helpful for an analytical group to assist in the evaluation of reports where regular staffs may not have the time to undertake such a study. In fact, it is suggested that special assistance may be of benefit as it is sometimes difficult for internal management to achieve a real break-through in their own traditional reporting structure. Any special study group, however, should not be dominated by individuals having the bias and prejudice that sometimes comes through close association with any one particular function.

It should be emphasized that as objectives and policies change, the reporting structure must change so that it continues to reflect significant elements of the objectives. Any attempt to standardize reporting on a continuing basis may have a damaging effect on the fundamental purposes of the information system.

Basic questions

No one questionnaire can be developed for all reports, and in many cases the general comments that are made will be the most valuable part of the analysis. Following are types of questions which need answering:

Name of report; issued by; distribution; period covered; when issued; information reported; source of information; method of compiling data — by man hours and machine hours required; method of preparing report; estimated annual cost of preparation; other reports containing similar information; and any comments.

From the recipient of the report should come answers for these questions:

Name of report? What objective is implemented by this report? Is it purely a check on performance? Is it timely enough to take action? What typical action has resulted from this report? Does this report duplicate information received in other reports? Is there too much or too little detail? Are significant facts and figures highlighted? Does the data change significantly during reporting cycle?

Can the report cycle be lengthened, or shortened? Are there elements of possible distortion in this report? What changes should be recommended in this report that might save time in analysis of facts and figures?

Distortion

Distortions due to price inflation have created reporting problems which did not exist when we had a more stable economy.

Inflation has affected the value of fixed assets to the extent that their original purchase price usually bears no reasonable relationship to current values. Reports which obscure this situation can be misleading, particularly where there is a heavy capital investment.

Comparative costs of any kind are not very meaningful unless consideration is given to the constant increase in the costs of labor and material. An increase of 10% in the cost of an operation over a two-year period for example, might indicate only that the number of hours worked and the material used were about the same.

Changes in dollar values make it extremely difficult to determine progress, since comparisons of data relating to more than a few consecutive years are distorted in reports that ignore inflation. Such data may seem to indicate growth and progress, when in *real* terms it may mean standing still or even moving backwards.

Other distortions

There are many elements of distortion which are not due to inflation. Technological improvements have consistently upset price structures. What may be profitable items today can be impossible to produce competitively tomorrow, if plans are not made to use the new technologies. A reporting structure has the responsibility of getting such information to the right people at the right time.

Sometimes costing activities which are not realistic, or not wholly satisfactory to an executive, can militate against the prime objective of keeping costs down and improving the profit position. The determination of product profitability can be made extremely difficult if costs are improperly computed, allocated, or reported.

An increase in sales volume does not necessarily mean an increase in profits and sometimes it means a decrease. For example, if a point is reached in the production of a product where overhead and fixed charges take a jump, it might be more profitable to cut back the marketing program on that product to avoid the cost jump. For similar reasons, a decrease in sales volume might mean an increase in profits. Here again, one must depend upon the right kind of reporting to determine these situations in advance.

Many times reports are made comparing what

seem to be similar areas and distortion results simply because they were not similar areas in the first place. Distortions of this type also occur whenever one company is compared with other companies or with national statistics. It is important in comparative reports of this nature that the possible elements of distortion are clearly indicated.

General Criteria

In order to achieve an effective reporting structure, there are some fundamentals which must be recognized. One of these is that much of the theory of reporting to management depends on the philosophy of the control group — how far they want to let out the reins. The value of many reports depends to a large degree on the accessibility of the units doing the reporting. The entire structure of reporting can sometimes be strengthened, simplified and prove less costly through maximum decentralization, provided that the functional responsibility of the activities reported takes place at the same time.

The most important part of the reporting function is the interpretation on the part of the recipient. There may be many reports issued which have only one obvious disposition simply because they are not simple, brief and self-explanatory. A management audience is no different than any other audience — interests and thinking are diversified. Some people like figures and technical data in black and white, with little or no narrative, some like a lot of charts and pictures and most like a little of each. There is often a tendency in report preparation to standardize according to the likes and dislikes of a particular segment of management, rather than according to the impact that reports have on the total audience.

Accounting and statistics do not themselves control anything. They are tools with which to motivate people to take the right action at the right time. Undue central control over these tools can sometimes remove the motivating factor from those who can take action.

A sound reporting structure must anticipate foreseeable operating contingencies insofar as it is possible to do so. For example, it should indicate in advance the precise effects of a decline in prices or adjustments necessary to cope with a wage increase. It should highlight the sensitivity of profit margins under various anticipated operating pressures. Management should not be compelled to resort to crash programs that might be ineffective and costly simply because of the lack of facts which might have been made available.

And finally, it is essential in report analysis to understand that costs of accumulating data and preparing reports can sometimes exceed the value of the control which can be exercised. ■

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RAY MARIEN

How Good Is Good Enough?

SEVERAL YEARS AGO, as a novice printing buyer, I gave an order for business forms to a new vendor. Forms printing was not his specialty, but he showed some acceptable samples of other types of printing and as a consequence he was asked to bid on one of our forms jobs. He got the order.

When the shipment of forms arrived it was so miserably printed that it was difficult to believe it had been done by someone who operated a commercial printshop for a living. We called that "printer" in and told him we were refusing the job. He was staggered — not merely by our refusal but by our attitude regarding his work. He had the notion that forms printing could be done in a sloppy manner! As he put it: "What do you mean, 'not acceptable'?—They're *only* business forms! For that, they're good enough! If you wanted a top quality job why didn't you say so? I'd have charged you *more*, but I'd have given it to you. After all, look at the low price I quoted. I've never heard of such an attitude over business forms!"

Well, undoubtedly that printer got the message the hard way. He had to replace the order and the loss came out of his pocket so he probably never forgot it. As an afterthought we might add that his price was not *that* low. It was reasonably close to the others.

Happily, that misconception about low quality work being acceptable for forms printing is gradually fading away. While it has not yet reached a point where critical tolerances on ink lay and color are insisted upon (*except in magnetic ink jobs*), it is thoroughly understood by good printers that forms printing is precision work. There is no room for the "schlock" printer in the forms field.

Forms quality important

The prime reason for the craftsman's approach to forms printing

is the critical design requirements of the modern form. Forms design is no longer a hit-and-miss task to be performed by anyone in the office. It's a skilled job placed in the hands of experts. Each ruled line is put in a specific place for a definite purpose. The measurements have to be exact, especially where the form is prepared by machine. Here, the most careful checks are made to assure close observance of vertical and horizontal spacing. There is scant margin for error on a form that races through a high speed printer in an elaborate data processing installation at 600 lines a minute.

Flat-bed letterpress printers have been among the slowest to accept these criteria. As a result, their forms business has dwindled away to a few specialties such as hecto masters. By far the greatest number of flat, cut forms are produced by offset equipment. It seems, to most observers, that offset printing, both sheet-fed and in rolls, will dominate the field in time to come. The printing quality offered by lithography is capable of producing smaller, sharper typed matter and accurate, cleaner ruled forms.

Nonetheless, one area in which letterpress printing has continued strongly is in the field of continuous forms and long-run snapouts. There, rubber-plate, web-fed, letterpress printing is quite economical and does an acceptable job where type sizes do not run too small, nor tolerances too tight.

That brings us to the theme of this column — how good is "good enough" in the forms printing business? Obviously, if a forms user has invested hundreds of thousands, perhaps millions of dollars, in data processing equipment, only top quality forms such as those produced by offset lithography, are acceptable. Where snapout forms are filled in by hand, where snapout and continuous forms are used on some of the simpler accounting machines, or

where the forms are not crammed with tiny spaces for entries, it would seem that good rubber plate web printing would work out fine. A top-flight rubber plate rotary forms printer knows how to get maximum results from his equipment and works hard to produce good quality work. There are limitations to what he can do, but by recognizing his capabilities and utilizing him accordingly, you can get excellent forms at low cost.

So much for the printing quality. In our next column we'll discuss the quality of the paper in business forms.

■ ■ ■

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In the eyes of his buddies maybe this will hold true. But what about the eyes of his boss?

Often those extra points of equipment that cause the ego to bulge turn out to be the same points that cause the P. & L. Statement to sag. Which ain't exactly kosher. A situation of this kind is the fastest way to convert D. P. for data processing into D. P. for displaced person.

There's a kind of temptation in this hectic, ulcer ridden business of ours to attempt to justify equipment on an "it's-the-thing-to-do" basis, rather than in good old fashioned terms of economy. This is true at least in offices that are not closely budgeted on a departmental basis. Especially with regard to computers, there seems to be a "jump on the bandwagon" campaign in progress. Some managers, in fact, when asked what equipment they control, are a little embarrassed to admit that they don't have a computer as yet.

"But, of course we're considering one," they hasten to add.

More often than not, where problems do exist, a computer may be the most practical and economic answer. If such is the case — rots 'o ruck.

It's the borderline situation, however, which should concern the conscientious manager — the situation where maybe you need a computer and maybe you don't. Give it some thought. Are you considering a computer, or any other piece of hardware, because you feel there's a good chance you could sell your boss on the idea? Or are you actually convinced it would make your department run more smoothly, efficiently and economically? If the added cost were coming out of your own pocket would you still be so hep on the idea?

Here's another side of the coin. Maybe — just in case that soul-searching probe made you a little uneasy — maybe it's not all ego at fault. Maybe you're inwardly convinced that EDP are the big three letters of the Sixties, and with this in mind you should get involved as soon as you can.

Is time ripe?

Obviously this reasoning isn't all loco. But any time you pull a plum off the tree before it's ripe you're going to end up with a sour taste in your mouth. If, consciously or unconsciously, you're exploiting your management in an effort to broaden your own scope or prestige there's something definitely rotten. And it's not in Denmark.

As a manager your primary obligation is to your company and the job you were hired to do. Any other attitude will inevitably return to haunt you later. Top execs and V. P.'s have an uncanny knack for nosing out employees whose personal interests conflict with the requirements of the job.

For the main part data processing guys and gals are a loyal and management-minded bunch. Where unjustified equipment is ordered or uncalled-for feasibility programs undertaken it's usually done in good faith. Still, whether we like it or not we're all subject to the beckoning finger of the bandwagon driver, plus the gentle persuasion of our sure-footed friend, the manufacturer's representative.

Here too we're still dealing with a gang of good guys. As a rule, neither the salesman nor the person sold is out to hoodwink anyone. A smoothly operating installation is to the mutual advantage of customer and manufacturer alike.

But all too often there's a need expressed. Business expands; a new application is pressing; paperwork problems are growing more complex.

This is the easiest time to unwittingly succumb to that old viper —

temptation, who often parades under the guise of progress.

The big capitalized and italicized point of all this is that before going off on a binge of sophistication it's the obligation of the data processing manager and his cohorts to first examine the *present* installation and facilities with a sharply critical eye.

Suppose we decide we're doing the best we can with what we have on hand. In this case, what simple and uninvolved changes can we make to get out of our bind? How about an extra shift, or half shift? It's remarkable, sometimes, what one machine operator running a machine after hours can accomplish.

If this isn't practical, before taking the giant step into computerdom, how does the personnel picture stack up? Any square pegs in round holes? Anything bogging down because of people?

If we're still happy with the reasonable state of our status quo the next step is conventional equipment expansion. Let's not go off half-cocked. Perhaps all we need to solve our problems is another collator or tab.

Gradually, a step at a time, build up your thinking in the direction of a computer, but don't take the plunge into sophisticated involvement until you're convinced you've out-grown your present facilities and made all the *economical* improvements possible. Then, give it all you've got, brother, and once again — rots 'o ruck.

Above all don't forget that you're working for the same company as the man you answer to, and the closer you can come to his way of thinking the better for you, your company, and ultimately, your career.

Don't forget, too, that when your boss brags about his accomplishments at his local meeting his subject is very likely to be not how much equipment you have on the floor, but how *little* it's costing to run the operation. ■

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By Douglas D. Hubbard

THE MOST COMMON MISCONCEPTION among personnel below the supervisory level in any field is that "the supervisor's got it made." This is especially true in the field of data processing, and although any supervisor would rather *be* a supervisor than *not* be one, it isn't all peaches and cream regardless of how it may appear on the surface.

In order to better understand the fellow with whom you find it so easy to find fault and whose job seems like such a snap, let's consider this business of being a data processing supervisor.

First of all, it must be assumed that the extent of his experience justifies his being supervisor. In most cases it does, and the nature of this expe-

What can you do?

First, suppose you get to work 15 minutes late. It doesn't matter to your subordinates that your three-year-old son overturned a bottle of maple syrup on you during breakfast and that you had to undress, bathe and redress. All they know is that the boss is late and they think it's a pretty crummy deal that he insists they be on time and then he doesn't show up on time himself. What do you do? Explain? Apologize? You don't *have* to — *you're* the boss, they aren't. Still, it would be nice if they knew it wasn't your fault you're late. On the other hand, you're going to lose a little face if you give them the impression that they deserve an explanation. So it's up to *you* to decide what you're going to do — you're the supervisor.



Drawbacks as well as compensations are found in a supervisor's bailiwick.

You Wanna Be Supervisor?

rience is two fold — he knows machine procedures like the back of his hand, and he knows the data requirements of his organization. He knows both of these only because, as one of his personal characteristics, he has that drive that demands him to learn and keep learning — not for the purpose of impressing somebody else, but for the purpose of answering that voice inside himself that never quits asking, "How, where, when, who, why?" He gets along with people, and he comes in contact with many: subordinates, superiors, fellow supervisors, salesmen, and others at one level or another. He deals with them according to whatever circumstances brings him together with them and no one leaves his presence feeling they were short changed, regardless of what their problems may have been. This fellow has the respect of his subordinates for the manner in which he encourages them to do justice to their jobs, and he has the appreciation of his superiors for getting the organization's paperwork processed efficiently and on schedule.

And now that this has been said, let it be admitted that it's so much easier to say than to do. It's along about here that the peaches and cream starts spilling away.

You notice one of your key punch operators is still gone on coffee break five minutes after the rest are back — again. You know she's been extremely high strung lately and that even the most tactful reprimand might be all it would take to cause her to walk off the job entirely, and the work load being what it is, you can't run the risk of losing her. At the same time, the rest of the key punch operators are beginning to show resentment over the fact that she's obviously getting away with something they can't and their resentment is beginning to show up in reduced volume of work produced and an increase in errors made. This is all happening at a time when you need an absolute maximum in production and accuracy to meet your critical month-end schedule. *You're* the supervisor — it's *your* problem. What are you going to do?

You answer your telephone to find that *your* superior (and you'll always have one, no matter how high you've climbed the ladder) is desperate for your assurance that the detailed monthly operating report will be in his possession by the first thing tomorrow morning. You assure him positively that it will be and inform him of the stage of processing it's in at the moment. He's relieved to hear that at the end of two more passes through

the sorter the cards will be ready for the tab and then it's just a matter of two hours running time. You hang up the phone just as your chief operator walks in to tell you the tab is out of service due to trouble that can't be repaired for the rest of the day. What do you do now? *I don't know* — you're the supervisor — it's *your* problem.

And it's just one of quite a slew that, as a supervisor, you're going to have to meet head on — and that's your first and foremost responsibility, to *meet* them, not sidestep them. People are going to start coming to *you* now, expecting answers. You better either have them or get them, but don't try to avoid the responsibility for having or getting. And above all, don't try to kid somebody you have an answer when you haven't. You have to be honest before anything else.

You'll have problems with schedules, forecasting, procedures, human relations, and a host of others, but the biggest shocker of all will be the discovery that supervising is much more difficult and delicate than being supervised.

Broad shoulders needed

You're going to have to start assuming the blame for the mistakes of those under your direction — that's your responsibility as supervisor. There'll be no excuses — explanations yes, but not excuses. If apologies are necessary for some boo boo that someone in your department has made, you do the apologizing to whomever is necessary and shoulder the entire blame yourself. And if it was Joe over there at the collator that made the boo boo, you don't march over and read him the riot act. You point out to him, tactfully, (*and in private*) that there's been more than a small measure of harm done as the result of his inattention to details or his failure to adequately follow procedure requirements, or whatever it was that caused the trouble. You listen to his side of the story too, as well as telling him yours. Two things you never do: you never say to the person to whom you're making explanations or apologies, "Oh, I didn't do that — that's Joe's fault," and you never run right over to Joe and jump down his throat. (*The best experience you can have along this line is to jump down somebody's throat in a flare of temper once and find to your agonizing chagrin that the recipient of your wrath is completely blameless and it's you who is dead wrong. It's a lesson you'll never forget.*)

You'll find that a good share of the things you always claimed you'd do if you were the boss are things that can't be done. For instance, as an operator you may have pounded the table and proclaimed that if you had your way there'd be more control panels and wires and other equipment to make things easier around here. When you are fi-

nally provided with the opportunity, as supervisor, to accomplish this sort of thing, you'll find that the opportunity is accompanied by the need for justification to your superiors (*because you've still got 'em*). Things that appear as necessities to operators have a way of appearing as something less than that to a supervisor who must justify their cost — all of which, as far as subordinates are concerned, is a big barrel of hogwash.

If you've spent a few years operating, and the chances are pretty good that you have, you'll find the temptation almost unbearable (*by then it's become practically instinctive*) to leave whatever else you might be doing to attend a machine that has run out, filled up, or jammed. To suddenly expect someone else to take care of error reset lights, double punch and blank column lights, or any kind of machine malfunction will seem almost sinful. A good supervisor, though, can't attend to his duties as supervisor by being an operator.

Incidentally, whether or not you choose to believe it, it's going to be a tougher go than you think to put those years of operating behind you and turn over to someone else the duties to which you have become so accustomed and in which you enjoy the pride of proficiency. The thing you must admit to yourself, though, is that if you don't stop operating when you *become* a supervisor you'll never stop afterwards — and you wouldn't have been made a supervisor by your organization unless it had been expected that you would do justice to the position once it was yours. You have to recognize that your job is no longer operating — it's supervising. Now you have to move back where you can see the whole picture more clearly, where you can take it apart and put it together again — better.

Conferences take time

You'll represent your department to management, and you'll represent management to your department. Neither is easy but both are necessary. You'll find yourself, of necessity, spending more time outside of the department conferring with different people about different problems than as an operator you were called upon to do. This will be regarded to one degree or another by those still in the operator ranks as an indication that your promotion has gone to your head. This will trouble you, but it's only one of the many misunderstandings that contribute to the fact that supervising is, in so many respects, a pretty lonely business.

As was said at the outset, however, any supervisor would rather *be* one than *not* be one, so it's reasonable to believe that there are more advantages than disadvantages, and I would be the first to admit that there are.

But as for the belief "that the supervisor's got it made," or "that his job is a snap" — HA! ■

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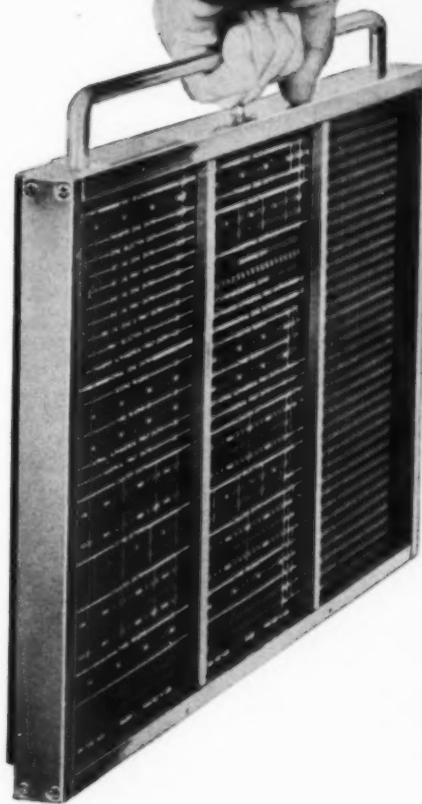
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IBM®

DATA PROCESSING

BURROUGHS CORPORATION ANNOUNCES
THE B 5000, WHICH SETS NEW STANDARDS



IN PROBLEM SOLVING & DATA PROCESSING

The new Burroughs B 5000 Information Processing System is a decided departure from conventional computer concepts. It is a problem-oriented system. Its markedly different logic and language are in large part dictated by the characteristics of ALGOL and COBOL. And it incorporates a complete set of operating, monitoring and service routines.

Additional operational features include an average add execution time of three microseconds, and a memory cycle time of six microseconds. Both character- and word-oriented, the B 5000 operates in binary and alphanumeric modes; a single set of arithmetic commands operates interchangeably on both fixed-point and floating-point numbers.

More important than these features is the fact that they combine with compiler-oriented logic and language to provide a new concept in computing—an integrated hardware-software system which sets:

NEW STANDARDS OF PROGRAMMING EFFICIENCY

Incorporating logic and language designed to take advantage of modern compiler techniques, the B 5000 permits straightforward, efficient translation of common-language source programs. And it brings a new high in compilation speeds—20 to 50 times faster than those possible on conventional computer systems.

NEW STANDARDS OF AUTOMATIC OPERATION

A Master Control Program, incorporating the automatic operating, monitoring and service routines, is pre-stored on a fast-access drum. It automatically schedules work according to pre-assigned priorities; allocates memory and input/output assignments; and maintains maximum-efficiency use of all components through a comprehensive interrupt system. As a result, human intervention is minimized, system efficiency maximized.

NEW STANDARDS OF PROGRAM-INDEPENDENT MODULARITY

Availability of multiple, functionally independent modules provides the B 5000 with excellent system flexibility and expansibility. The system may include one or two independent processors; up to eight core memory modules with a total capacity of 32,768 48-bit words; and one or two fast-access bulk storage drums, each with a capacity of 32,768 words. Up to four independent input/output channels control a maximum of 26 input/output units, including up to 16 standard-format magnetic tape units. Additional input/output units include card punch and reader, two types of printer, plotter and keyboard.

NEW STANDARDS OF EFFECTIVE MULTI- AND PARALLEL PROCESSING

The Program Independent Modularity of the B 5000, combined with the automatic scheduling and control features of the Master Control Program, permits multi-processing—the B 5000's normal mode of operation. The addition of a second functionally independent processor provides true parallel processing ability.

NEW STANDARDS OF SYSTEM COMMUNICATION

The new B 5000 permits simultaneous on-line/off-line operation. It features completely flexible communication among all of its units. A central processor communicates with all memory units. Any input/output channel communicates with any peripheral equipment and any memory module.

NEW STANDARDS OF THROUGH-PUT PER DOLLAR

All of these B 5000 features combine to provide an important new standard of throughput—the maximum amount of work in the shortest possible time, using the fewest possible components. The result is large-scale performance in the medium-price range.

For details in depth on the B 5000, call our nearby office. Or write for a copy of "The B 5000 Concept" to Data Processing Division, Burroughs Corporation, Detroit 32, Michigan.

Burroughs—TM



Burroughs Corporation

"NEW DIMENSIONS" in electronics and data processing systems

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Punched Card Ideas

BILL KLUMPP



Educational data processing

Registration week at many colleges and universities is a bedlam of orderly confusion. Students report to a large building which is organized like an induction center. Each student receives an identification master card. He fills out this card. Then he picks up his course cards. His batch of cards, together with thousands of other batches, eventually land in the data processing installation of the college or university. The personnel of the installation process the cards, usually working around the clock for several days. Through grim energy and resolute courage, class lists for instructors, reports for accounting offices and punched card files of student records are produced. After the bedlam of registration week, the data processing installation produces regularly scheduled reports for the various deans and the accounting office. Statistical reports are a by-product.

Columbia University and the University of Michigan pioneered in data processing for educational institutions. One by one other colleges and universities decided to use punched card techniques when registrars' offices were swamped with paper work. Today, over a hundred colleges and universities have data processing installations. The controllers and supervisors of these data processing centers meet once a year. Their annual conference is still informal.

Since there has been no Hollywood fanfare, the meetings of the Machine Records Conference for Educational Institutions have not been heralded far and wide. You may not have heard that the representatives of over a hundred data processing installations in the United States and Canada held their annual meeting in 1960 at Marquette University of Milwaukee. In 1961 the Conference will hold its sessions at

Penn State University in the State College Borough of University Park, forty miles from Altoona. Wayne State University in Detroit will be host to the 1962 Conference.

Student record posting

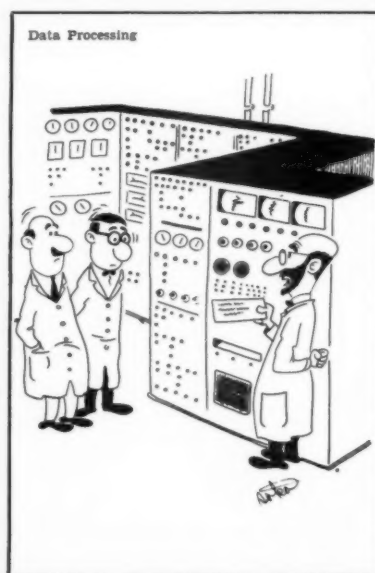
In most colleges and universities the posting of student grades to the permanent record of the student is one of the applications. Until recently the posting was made on the record card by the accounting machine with a bill-feed, or by a transfer posting machine from an accounting machine listing with a reversed spirit-duplicating carbon. Manual operations are the bottleneck in the procedure. A new development resulting from the exchange of ideas at the 1960 Conference, reduces the manual operations to a minimum.

The key to this new technique is the use of labels which are manufactured in continuous fanfold forms. Each student name card is followed by four or five course grade cards for the accounting machine run. The control is on the student I. D. (identification) number in each card. When the run is completed, each label contains the pertinent student information, a list of the courses, course numbers, credit hours, grade points and quality points. The fanfold labels are then run through a labeling machine. As the machine peels off each label, the operator turns the label right side up, checks the matching of the I. D. numbers on the label and on the permanent record, and places the label on the proper square of the record.

Student records and computers

The possibility of using computers for maintaining student records opens up an entirely new vista. The academic records of the entire student body would be stored in the memory unit of the computer. At the end of each semester, the record

of each student would be updated in much the same way as a stored inventory. After the file is updated, the records of the entire student body would be transferred from the memory unit to magnetic tape. The records would be printed from the tape at speeds of 600 lines per minute. All the manual operations involved in pulling each student record, posting and refileing would be eliminated. Where the size of the student body is 5,000 or more, the time involved in programming the posting operation for the computer would be more than justified. Several of the large universities in the country have one or more digital computer systems in their engineering schools. Digital computers may be used for some of the applications which are now being done by conventional data processing equipment. The tape record would free the computer for its usual engineering problems. ■



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CONTROL AT

SARAH COVENTRY



John T. Joyce, Executive Vice-President and General Manager of Sarah Coventry Inc.

"Moore forms help us fill orders in 1 day instead of 4"

THE SETTING: Sarah Coventry Inc. sells almost 11 million pieces of fine fashion jewelry a year to 4 million customers, through a field force of 20,000 'modern living room salespeople.' A previous order/invoice system having 22 steps and 2 manual forms took 4 to 5 days to process and helped perpetuate operating weaknesses. Among them: shipping/pricing errors; stock delays hampering production; back-order 'double work' and, during peak 7000-order days, a staggering, uncontrollable task.

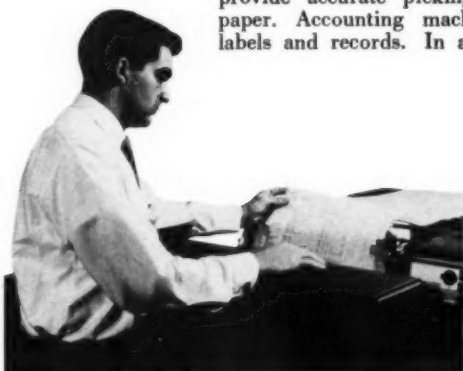
THE SYSTEM: One form has replaced 2 in an automated operation that fills orders in only 24 hours. It begins with detail and lead cards manually punched from input order data to provide accurate picking/shipping/invoicing paper. Accounting machines print shipping labels and records. In another operation, in-

voices are a direct instead of 22-step operation.

An automatic by-product is the punched statement card used to compute salespeople's commissions, now paid weekly; also taxes, merchandise sold and accounts receivable. In other gains, shipments are accurate; volume variation is handled smoothly; a 'daily aggregate' furnishes stock and production control. The 3-part custom Speediflo, a Moore form, is the company's control in print.

THE COUNSELOR: "The Moore man contributed to this improvement with an understanding of business procedures, practical knowledge of forms construction plus a good cost-cutting instinct," said John T. Joyce, Sarah Coventry Executive Vice-President. If your system isn't performing the way you feel it should, write the nearest Moore office—without obligation.

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NEWS SUMMARY

NEW GROUPS

The leading American and Canadian computer and punched card service bureaus have formed the *Association of Data Processing Service Organizations (ADAPSO)*.

A proposed constitution for an *American Federation of Information Processing Societies* has been prepared and has been approved in principle by the executive bodies of the three sponsoring societies: ACM, IRE and AIEE, and is now in the process of being ratified.

GOVERNMENT

The Federal government, as of mid 1960, had 540 electronic data processing machines, exclusive of those for military use, of which 370 are in the Department of Defense. Estimated 1960 operating costs were about \$295 million for all, \$192 million for those in Defense. Only four of the 100 computers expected in 1961 will be purchased; the balance will be leased.

NEW USES

The American Stock Exchange has purchased (\$3 million) a new communications facility with the world's first complete, electronically automated *quotation network*—history's first commercial application of a combination voice-produced and printout reporting technique.

An RCA 501 is being employed at the Princeton, N. J. headquarters of the Educational Testing Service to facilitate the *reporting and interpretation of test results* on the College Board examinations administered six times a year throughout the world. This is the first use of a computer system with a magnetic tape memory in the processing of nationwide testing programs.

NEWS IN COMPUTING

Rem-Rand Univac has a *marketing plan* to permit users of Univac File Computers to double the data processing capacity of their present systems, at no increase in rental charges, by replacing the old magnetic drum storage with core memory.

Speed-of-light computer circuitry has been devised by RCA, through use of tunnel diodes, to make circuits 100 times faster than any system in existence, and up to 1,000 times faster than circuits in most data processors now in use. This is being designed for an ultra swift electronic computer for the U. S. Navy.

Minneapolis-Honeywell's first two *H 800s* were delivered at year end, one to Associated Hospital Service of New York and the other to American Mutual Liability Insurance Company of Boston.

In the last half of 1960, *deliveries* have been made of the first group of IBM 1401, IBM 1620, PB 250, Honeywell 800, and GE 225 systems.

IBM has inaugurated an *Invention Award Plan* for their employees wherein the best creative inventions in such fields as solid-state physics, chemistry and computer circuitry will be rewarded by cash. The first presentation will be for inventions filed before December 31, 1960.

Business gaming has proved its worth, according to American Telephone & Telegraph who claim this technique is "by a wide margin the best accepted training program we have yet introduced." AT & T has had more than 15,000 middle management men sharpen their executive talents through gaming. More than 100 top corporations and a similar number of colleges and universities are using the technique to broaden managerial thinking and improve decision making.

Litton Systems, Inc. has acquired the Applied Communication Systems division of Science Research Associates, Inc., of Chicago, a developer and manufacturer of specialized audio-visual equipment.

Moore Business Forms, Inc. has opened its New Central Division headquarters in Park Ridge, Ill., and is planning to build a million dollar plant for the manufacture of business forms in Rutland, Vt.

RCA Electronic Data Processing Division has opened a new sales office in Denver to serve Colorado, Utah and South Dakota.

FOREIGN

Japan's first order for a National Cash Register 304 was placed by the Fuji Iron & Steel Company, one of the country's leading iron and steel manufacturers, with main offices in Tokyo. The order, for over \$1 million, covers a complete *304 data processing system* and 23 NCR accounting machines associated with the system. Delivery will be early in 1962. ■



Completed achievement tests are scored electronically in regional office of California Test Bureau.

APPLICATION OF THE MONTH

the first step in the services that Cal Test offers its customers. To make the test results more useful to teachers, CTB expands the data electronically. These data are then used to analyze student responses and compare them against a national standard.

CTB maintains an electronic data processing center in its main office in Monterey. To process the scores received at other offices, CTB uses Olivetti Preparation Units, which produce both hard copy and punched paper tape. The tape is

Test Bureau

Teletypewriter used for low cost data processing network.

CALIFORNIA TEST BUREAU (CTB) is using off-line preparation units which produce typed copy and punched tape as data input devices to generate data processing on a nationwide basis from a single punched card installation.

This system offers the data processing services of California Test Bureau's Monterey headquarters to each of CTB's regional offices without their having data processing equipment.

Use of the preparation units insures the quick and efficient processing of student scores while equipment costs are confined to one installation.

This system is one of the latest in a long line of developments which CTB has engineered to accelerate the process of test scoring and make the results more beneficial to teachers.

The Bureau was founded in 1926, and is one of the oldest commercial testing bureaus in the country. It has served more than 100,000 school districts and colleges in the United States and 28 foreign countries. It scores thousands of test papers each day during the regular school year.

Regional scoring

These tests are not all scored in the same office. To keep the service as close to test users as possible, CTB maintains four regional offices. These are at Monterey, California; Madison, Wisconsin; New Cumberland, Pennsylvania; and Dallas, Texas.

Tests arriving at any of these four offices are promptly graded on electronic test scoring machines. Obtaining raw scores, however, is only

transmitted over a teletypewriter network or used in tape-to-card converters as entry information into a data processing system. This makes possible benefits of data processing at each of the offices, while having equipment only at the one headquarters.

How it began

CTB has come a long way from its beginnings when Mrs. Ethel M. Clark, founder of the company, opened with a direct mail advertising cam-



Data on test results is entered into punched tapes on Olivetti T2CL Tape Preparation Unit.

paign that consisted of exactly 25 penny postcards. The postcards were mailed to a select list of school districts which had shown interest in the pupil testing materials being designed for Los Angeles City Schools by Dr. Willis W. Clark, assistant director of research for the Los Angeles City schools.

During its early years, CTB devoted itself to assembling a staff of test experts who could create and write newer and better tests and testing systems. This was a painstaking task since constant study and research are needed in the development of new tests. It has been estimated that one to five years are required to develop a new testing program, while ten years may be necessary to complete some programs.

Most of the tests CTB developed were diagnostic tests, designed to analyze the educational weaknesses and strengths of school children. Tests were planned to develop a diagnostic profile of the child at an age where children are still pliable enough so that deficiencies could be corrected or lessened through proper analysis and remedial teaching.

Today, CTB is an organization which supplies a complete testing service, from original conception to analysis of results.

CTB uses the most precise punched card and electronic equipment available. Machines, such as a new electronic scoring punch, are used to process scores in as little as 10 percent of the time formerly required and to present the results in a form that can be efficiently analyzed and diagnosed.

One of the developments that has heightened CTB's efficiency is the scoring system utilizing Olivetti Preparation Units.

Today's system

The system works like this: A batch of completed-but-unscored tests comes into one of the branch offices. The tests are scored at that office



Olivetti machine provides both printed proof of entries and punched tape compatible with both teletypewriter and punched card systems.



Five channel tapes are converted to punched cards for central data processing support of widespread regional offices.

and the results are recorded on any T2CL preparation unit.

These preparation units were supplied by the TELautograph Corporation of Los Angeles, North American distributor for Olivetti teletypewriters and associated equipment. The T2CL is the first unit introduced on the American market which makes it possible to produce a perforated tape at high speed — up to 100 words per minute — while at the same time typing a hard copy of the data on standard paper or forms.

Aside from the fact that it is an off-line unit, the T2CL is identical in every respect with a standard Olivetti teletypewriter. The tape reperforator is mounted directly on the machine, producing hard copy and tape from a single unit.

The hard copy produced provides CTB with a close-accuracy audit. That is, the hard copy serves as a proof sheet. It can be read and checked against the source documents to verify accuracy. Verifying the hard copy automatically verifies the accuracy of the punched tape which was produced from the tape by a tape-to-card converter; it will also be accurate and reliable for statistical operation.

Tape transmission

The tape from the T2CL can either be transmitted by TWX or used as entry information into a data processing system. This makes the T2CL the first integrated data processing input device of its type ever marketed.

When CTB scores a test at one of its regional offices, the tape obtained is mailed to the Monterey headquarters, which has a complete data processing center. When it arrives at the CTB headquarters, the tape is fed into a tape-to-card converter, reproducing the data as holes on standard 80 column cards which can be processed through all punched card equipment.

CTB processes these decks of score cards in

the same manner as test results which come directly to the Monterey office, eliminating only the key punching operation required to transcribe the source documents.

The cards are sorted to provide carefully arranged decks, either alphabetically by pupil name, or numerically by test result.

Many tests are taken by battery, that is, groups of several tests which will produce one common achievement score. The individual tests within any given battery are collated and the scores of the battery tests are reproduced on a single card.

Calculations (*if necessary*) are performed and final results are printed as a class record sheet, individual record sheet or frequency distribution sheet.

These score sheets have supplementary data to show what the norm for students taking the particular test is on a nationwide basis. This allows teachers to compare the achievements of their pupils with a national average and also allows them to see how their school compares with other schools across the country. Comparing test scores against a national average is one of the important services offered by CTB.

All procedures are specially designed to provide comprehensive, accurate scoring and analysis. In this set-up the preparation units, with their dual-media approach to score reporting, increase speed and efficiency of services.

As data input devices, the preparation units produce material which is completely compatible either with TWX circuits or IBM systems.

Breaking the bottleneck

When CTB began analyzing test results on punched card equipment, the branches used to mail the score sheets to the home office for card punching. This created bottlenecks in California. Later a TWX was installed for transmission of data via wire. Results were received on punched tape as well as in typed form. This worked well, but line charges increased costs of data input.

Introduction of the Olivetti equipment preserved the advantages of decentralized data input. Only one day is lost when tapes are airmailed to California. Costs have been reduced to less than one cent per case.

The significant gain, however, is in the increased ease with which the test results may be expanded through machine methods to produce data of maximum usefulness to teachers. CTB is continually conducting research programs to discover new and better methods of machine processing student data, so that pupil responses may be analyzed for weakness in selected areas of achievement. The preparation units provide just one more tool in CTB's effort to help teachers do a better job of teaching.

BEEMAK TAB CARD HOLDERS



BP-100 CARD HOLDER

Can be attached to products, conveyor belts, bins, boxes, shelving, to implement production control, inventory control, invoicing and other punched card systems. Beemak Holders have withstood hard usage for eight years and are made in ivory, red, green, blue, yellow and black for color coding if desirable. Keeping correct tab cards at the source of record data provides better controls and faster handling of all types of merchandise.



BP-130 MAGNET HOLDER

Card holder with four heavy permanent magnets can be attached or hung on any metal surface such as tab machine, filing cabinet or metal desks. Provides finger-tip accessibility to operators, reduces wasted time and chances of error.

1 to 24 \$1.50 each; 25 to 49 \$1.35 each; 50 or more \$1.25 each. Available for immediate delivery from

BEEMAK PLASTICS

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Coming Events

MARCH 16-18

NOMA Business Education Conference
Washington, D. C.
Contact: W. T. Cavanaugh, NOMA, Willow Grove, Pa.

MARCH 16-22

Society of Savings and Loan Controllers Annual Meeting
St. Francis Hotel, San Francisco, Calif.
Contact: Charles Borsom, 221 N. LaSalle, Chicago, Ill.

MARCH 20-23

IRE National Convention and Show
New York Coliseum, New York

MARCH 20-24

SHARE—IBM 701, 704, 709, 7090 Users Group Meeting
Jack Tar Hotel, San Francisco, Calif.

MARCH 27-29

POOL, LGP-30 User Group
Jung Hotel, New Orleans, La.

APRIL 4-6

National Microfilm Association 10th Annual Meeting and Convention
Sherman Hotel, Chicago, Ill.

(continued on next page)



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Quality never takes a holiday at VPC! Each panel is tested in an IBM receiver like the receiver built into the machine and inspected with fixtures and gauges to insure exactness of fit. All VPC products are unconditionally guaranteed, controlled as to design and construction to meet IBM exacting specifications and your complete satisfaction. Black phenolic sections are molded for closer tolerances — eliminates holes getting larger from wire insertions . . . specially developed screening technique for larger, sharper characters . . . thermo-plastic, snap on and off covers that *will not conduct electricity* . . . Self-Contacting and Jack-Type wires with patented "F" Crimp process to reduce corrosion . . . one-piece terminals which will not break.

VPC manufactures its own panels and keeps in stock at all times a complete line of control panels and wires for every IBM installation for immediate delivery.

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(Continued from preceding page)

APRIL 11

Conference EDP Division, Institute of Office Management
56 Victoria St., London, SW 1, England

APRIL 13-14

Univac Users Association Spring Conference
Statler Hilton Hotel, Los Angeles, Calif.
Contact: D. B. Houghton, Secretary, USE,
% Westinghouse Electric Corp., 3 Gateway
Center, 15-West, Pittsburgh 22, Pa.

APRIL 17-21

Office Equipment Manufacturers Exhibits, Inc.
Business Equipment Exposition
New York Coliseum, New York
Contact: Malcolm M. Semple, Dir. Pub.
Info., OEME, 777 Fourteenth St., N.W.,
Washington 5, D. C.

APRIL 18-21

Univac Users Association Use Meeting
El Paso, Texas
Contact: J. W. Nikitas, Exec. Secy. USE,
315 Park Ave., So., New York 10, N. Y.

APRIL 19-20

15th Annual University of Tulsa Conference
of Accountants
University of Tulsa Campus, Tulsa 4, Okla.
Contact: Carl J. Senger, Warren Petroleum
Corp., Tulsa, Okla.

APRIL 19-21

13th Annual Southwestern IRE Conference,
Memorial Auditorium, Dallas, Texas

APRIL 20-22

2nd Annual Conference on Data Processing
University of Florida Campus,
Gainesville, Florida
Contact: John T. Branch, Jr., 806 Seagle
Building, General Ext. Div. of Fla.,
Gainesville, Fla.

APRIL 30-MAY 9

German Industrial Fair
Hanover, Germany

MAY 1-2

Association of Records Executives and Adminis-
trators 4th Annual Conference on Records
Management
Hotel Roosevelt, New York, N. Y.
Contact: Miss Judith Gordon, Publicity
Chairman, AREA Conference, % Metal
and Thermit Corp., Rahway, N. J.

MAY 2-4

IRE Electronic Components Conference
Jack Tar Hotel, San Francisco, Calif.

MAY 4-7

Institute of Office Management National
Conference
56 Victoria St., London, S.W. 1, England

MAY 7-10

NOMA 42nd International Conference
Sheraton-Jefferson Hotel, St. Louis, Mo.
Contact: W. H. Latham, Field Service
Division, NOMA National Office,
Willow Grove, Pa.

MAY 9-11

Western Joint Computer Conference, IRE,
AIEE and ACM
Ambassador Hotel, Los Angeles, Calif.
Contact: Dr. C. T. Leondes, Dept. of
Engineering, University of California, 405
Hilgard Ave., Los Angeles 24, Calif.

NEW SERVICES

FMA, Inc. announced the establishment of an ISR division to provide customer services in the general field of information handling, storage and retrieval. Consulting services will be available for analysis of information handling problems and assistance in designing operating systems.

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COMPUTER-CONSULTANT

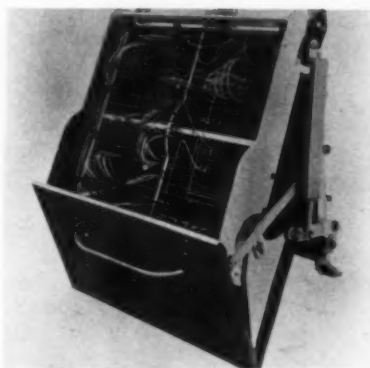
A consulting engineering firm, S. Himmelstein & Co., specializing in magnetic recording systems and computer peripheral equipment, has opened offices at 3300 West Peterson Ave., Chicago. The company is available to assist equipment manufacturers with engineering and design problems, provide advice to equipment users, and serve as a contributor to large scale technical proposals.

Circle no. 41 on reader service card.

COMPUTER CENTER

National Cash Register Company has opened a new computer service in New York City, to make electronic data processing available to companies as small as a neighborhood store with one cash register. The center is equipped with an NCR 390 to prepare sales and inventory reports, payrolls, customer bills and other business records.

Circle no. 42 on reader service card.



PLUGBOARD SYSTEM

A complete line of plugboard programming systems is available through the OEM Division of MAC Panel, producer of control panels and electronic data processing components. Six complete systems are available ranging in size from 160 to 5,120 contacts.

Circle no. 43 on reader service card.

PRODUCTS SERVICES



PHOTOCELL READER

Rheem Manufacturing Company's Electronic Division has a new Photocell Reader. Originated for automatic numerical positioning controls for machine tools, the reader is now available to meet requirements for general purpose punched tape reading including data processing and process control. It is completely transistorized; the sensing element is one piece of silicon containing eight information and one timing track channels. This eliminates focusing problems often found when each channel uses its photocell as a sensing element. It uses five, seven and eight channel tapes, paper or aluminum Mylar, and reads at 100 characters/second. It is priced at \$695.

Circle no. 44 on reader service card.

MOBILE FILE

A new mobile file with 30 compartments designed to store the various sizes of self-contacting and prong wires found in data processing departments has been announced by Edward Ochman Systems, Fairfield, Conn. The file has a specific drawer set aside for each type of wire for better housekeeping, easier finding

and replacing of wires, and more departmental efficiency. The steel unit is 12" deep by 30" long and 36½" high.

Circle no. 45 on reader service card.

(continued on next page)



NOTABLE QUOTES

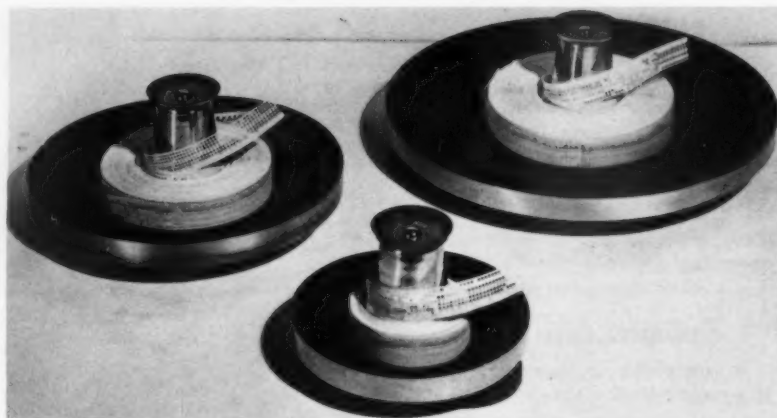
"The big office turned small by new technology doesn't solve the problem easily. The two man computer department is dependent on highly specialized and trained workers. When one of these workers is missing, the office suffers many times the loss of a single worker output.

"Do these difficulties mean that computers aren't practical? No. It merely means that big office management needs to plan for different problems than before. The computer will produce many times more paperwork and operating data than any other system. It's more accurate.

"Many temporary help services have qualified personnel to take over office jobs when you need them. Data processing service centers are an important help. Use their personnel and equipment for stand-by assistance. And most important, train the second man in the computer department so he is a capable replacement." Editor's Notebook, *Modern Office Procedures*, December, 1960.

"'Integrated data processing,' writes Mr. J. Graham Smith in one of the supplement's (The Times) articles, 'does not come about merely by installing machines, but by careful appraisal, education and implementation of these exciting new techniques.' The *exciting new techniques* refer to using punched paper tape and edge-punched cards and can be considered as a piece of special pleading (which is none the worse for that), but the premise that you do not get IDP by installing a computer holds good." Comment, *"The IDP Bit," Automatic Data Processing*, London, November, 1960.

"In a company's electronic data processing program, the credit manager should provide leadership in establishing the requirements for adequate credit management information, and should also guide the development of the program to handle the mechanics of credit decisions to insure that these activities fit into the overall data processing system." Paul A. Henschen, *Credit and Financial Management*, January, 1961.



CENTER FEED UNWINDERS

New center feed unwinders, offered by Dresser Products Incorporated, make it possible to plan consecutive use of punched data tapes without rewinding. The center feed unwinders are available in six, nine, and 12 inch diameters; they are suitable for use on all transmitting equipment and on tape-to-card units.

Circle no. 46 on reader service card.

PAPER TO MAGNETIC TAPE CONVERTER

An all solid state system to extract data from punched paper tape and write it onto magnetic tape has been developed by Tally Register Corporation, Seattle.

Tally Model 1433 converts the data

so that input and output are identical in content. No code change is normally performed, with the output record being a bit for bit image of input perforated tape except for format changes as outlined below.

A universal code conversion feature is available as an extra, with same format controls as a basic 1433.

The Tally system will accept paper, foil or plastic tapes in widths of from five through eight channels. It can write data on magnetic tape in formats compatible with IBM 727, 729 I and Remington Rand computer inputs.

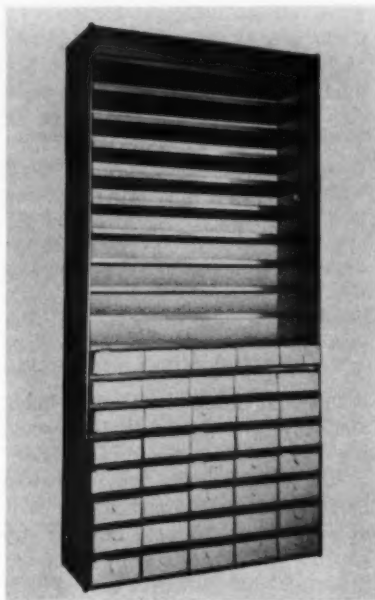
The system is complete; it includes a paper tape reader of 120/-characters per second, a magnetic tape handler and necessary elec-



DATA PROCESSING

tronics for control and tape format. Price of the 1433 system starts at \$26,500, with delivery in 120 days.

Circle no. 47 on reader service card.



STORAGE UNIT

The Punched Card Storer, a product of Frontier Manufacturing Company of Dallas, is a new unit of steel requiring less than four square feet to file 180,000 cards. It affords storage for 90 boxes of 80 column size cards.

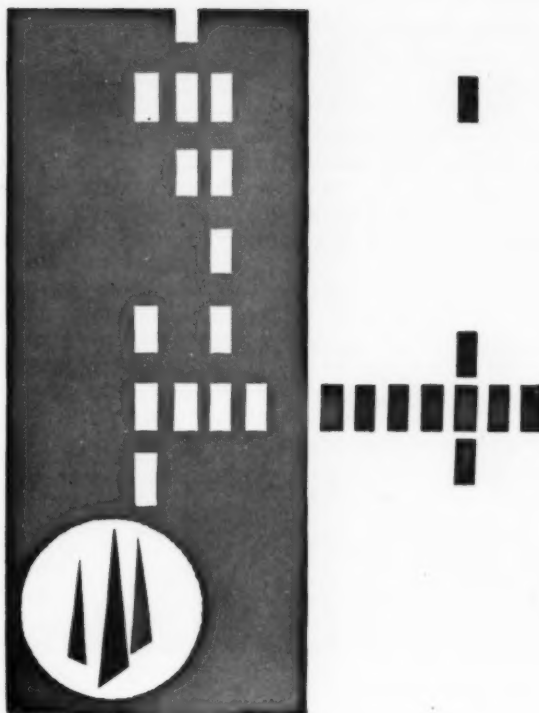
Circle no. 48 on reader service card.

COMPUTER-TO-COMPUTER COMMUNICATION

Control Data Corporation announced that they are experimentally testing a new microwave data link for high speed digital data transfers between computers situated miles apart.

Control Data previously announced its Satellite Computer System, which allows a number of its intermediate-size Model 160 computers to communicate with its large-scale Model 1604 computer and associated peripheral equipment via cable. Magnetic core memory-to-memory transfers are used in this technique. The new microwave link allows Control Data Satellite Computer Systems to communicate over many miles, limited in distance only by "line-of-sight," although the distance can be extend-

(continued on next page)



PROGRAMMERS... Calculate Your Chances For the Future at Thiokol

SPECTACULAR GROWTH has been experienced by THIOKOL in UTAH in the past three years of highly successful research and development work on the USAF MINUTEMAN ICBM.

THIOKOL HAS FIRM CONTRACTS to continue its R & D activities in the SOLID PROPELLANT FIELD and to manufacture the first stage engines for the MINUTEMAN.

OPPORTUNITIES for advancement will continue to be excellent with the expansion of the Utah operations. *Openings exist now for analog analysts, mathematicians and statisticians, and for digital programmers with scientific, business or systems experience.*

RECREATIONAL FACILITIES are unusually good in the "Center of Scenic America" ... good climate ... many liberal employee benefits.

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Utah Division — Wasatch Division
Brigham City, Utah

ed virtually indefinitely by use of unattended repeater stations.

Digitally-modulated microwave impulses are currently being transmitted in two directions via a Motorola Model MR 40 12,000-megacycle broad-band microwave communication system between a Control Data 1604 computer located at Control Data headquarters, 501 Park Ave., Minneapolis, and a Control Data 160 computer located at Control Corporation, a subsidiary of Control Data.

Checked data are being transmitted at a rate in excess of 1,200,000 binary digits per second from

the magnetic core memory of one computer to the magnetic core memory in the other.

This data rate is believed to be the highest ever achieved via radio communication, and the development of this technique allows computers to communicate with one another over long distances and at lower cost than ever before possible, according to Control Data.

The new data communication system takes advantage of an October 5, 1960 ruling of the Federal Communications Commission which greatly extended microwave licens-

ing policies to permit wider use of this low-cost communication medium. This is considered to be in the broad public interest. The October 5 ruling liberalized the eligibility to privately own and operate microwave communication facilities at 6,000 and 12,000 megacycles. Previously, microwave licensing had been available only to government agencies and right-of-way companies, and a few industrial operations, for a total of about 3,000 stations, under which program microwave has been well developed. It is estimated that approximately 15,000 new stations will be licensed in the next 10 years.

Circle no. 49 on reader service card.

companion piece to your data processing...

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pre-addressed from card or tape

TO ALL TYPES OF PRINTED PIECES



CHESHIRE **MODEL E**

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CHICAGO 22, ILLINOIS

Circle no. 18 on reader service card.

WASSELL VIS-O-MATIC

The first automatic electric index-visible rotary file for data processing cards, Vis-O-Matic, was shown at the OEMI exhibition in November. The file holds six thousand cards at instant access on 40 vertical panels. It is 32 inches in diameter, mounted on the micarta topped 35" x 45" gray steel desk containing the electric selector mechanism. Each slot in the selector corresponds to a legend designating one of the 40 vertical panels. Each side of the panels will hold 75 data processing cards.

Wassell business products are now available for leasing through Equitable Leasing Corporation, New York, N. Y.

Circle no. 50 on reader service card.

CONSOLE CARD READER

The new IBM 7502 provides direct card input to the 7080 data processing system. It is a communications link between the operator and the tape 7080, to handle small volume card input.

Cards are read up to 60 a minute at a single read station where the punched data is photoelectrically sensed. Each card column is translated automatically into one corresponding binary coded decimal character. The 7502 reads cards to determine sequence of loading programs from master program tape, or to enter program patching cards, or load sorting control cards, or to process late transactions, or enter constant factors into memory and process data correction cards.

Circle no. 51 on reader service card. ■

NEW EQUIPMENT

BURROUGHS B5000

AT A NEW YORK PRESS CONFERENCE the Burroughs Corporation announced their new information processing system — the B 5000 — in February. The system is medium to large, depending on the desired configuration, and can be expanded without need for reprogramming because of unique features built into both the hardware and the included software (programs). The software package includes ALGOL (*Algorithmic Language*) and COBOL (*Common Business Oriented Language*) compilers, as well as extensions of each, and a comprehensive master control program standard with each system.

The aim was to enable users to communicate efficiently with the machine in the language of the problem (*English for data processing, algebraic for scientific-engineering*) both for the initial programming and subsequent symbolic debugging, rather in complex numerical codes. Object machine language programs will be compiled by the B 5000 automatically, 20 to 50 times faster than the most advanced automatic programming techniques employed thus far on conventional computers.

The master program makes the system virtually self-regulating, keeping track of its own workload, by-passing units which may malfunction, and advising its operator of his mistakes. The computer automatically performs diagnostic maintenance routines to assure max-

imum up-time, either during processing or at the conclusion of all processing. Should need for the system expansion arise there is no lost time for reprogramming, for there is no need to reprogram.

Multi-processing, which allows all the elements of the system to be used to maximum, is a feature of this system. Any two or more completely independent programs can be run simultaneously.

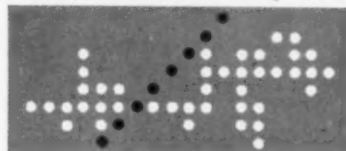
The master control program, which directs controls and sequences of the system, assumes the allocation to memory, equipment assignment and information routing. Programs and data are completely independent of memory address within the processor and are automatically segmented during compilation into logical divisions. This makes the system capable of accommodating programs which exceed the core memory capacity of a particular hardware group.

The B 5000 master control program controls one or two parallel, independent processors, each of which may be operating on different programs or segments of the same program. It allocates space within one to eight memory modules; it controls automatic selection of one to four independent input/output communication channels which may use any memory module for communication with any data handling device. Through these communication channels, it maintains control of up to 26 peripheral components. Each processor may be operating on one or more programs, time-sharing

(continued on next page)



FROM OMNITRONICS, INC.



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with these exclusive features:

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The application of a chopped light system enables Model PTR-7 to use A.C. Amplifiers, thus eliminating the drift common to D.C. Amplifiers. Result: *outstanding stability!*

NEW RELIABILITY WITH REFLECTED LIGHT PRINCIPLE

Omnitronics, Inc. Model PTR-7 uses reflected light in the actual reading process for a better signal-to-noise ratio particularly in reading the more translucent tapes.

Result: *greater reliability!*

NEW HIGH PERFORMANCE WITH QUALITY COMPONENTS

Such as stable silicon solar cells, solid state amplifiers and power supplies for longer life, smaller size and lower power requirements and simple mechanisms.

Result: *high performance operation!*

Check These "Plus" Features

- ✓ Ultra-compact, needs just 5 1/4" of rack space
- ✓ Optional selection of tape speeds, 10, 30, 75 or 100 inches/sec.
- ✓ Quick, Easy In-Line Loading
- ✓ High speed stop-start
- ✓ Weighs just 28 lbs.
- ✓ Reads standard tape widths 11/16", 7/8", 1"
- ✓ Reads up to 8 channels and sprocket
- ✓ Simplified, complete controls

FOR
THE
ASKING

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on Model PTR-7, specs
and prices... drop us a
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Subsidiary of
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Visit our IRE booth 4225

Circle no. 16 on reader service card.

equipment on the basis of availability and prescheduled program priorities.

It is possible to perform four read/write operations to peripheral components simultaneously with program execution on one or two processors: read-while-write-while-compute.

The B 5000 consists of different combinations of the following units, depending upon the desired configuration. The rental prices range from \$13,500 to \$50,000; sales prices range from \$540,000 to \$2,000,000.

PROCESSOR

One or two parallel, independent, solid state processors may be installed. Each has a 1 megacycle clock rate with average add execution time of 3 micro-seconds. Processors operate on 49-bit words (48 bits plus parity bit) which may be interpreted in binary or alphanumeric form with common fixed-point and floating-point number representation. Instruction format: 12-bit operators or addresses, packed 4 to a word, executed sequentially with unlimited indexing ability. Internal operation is word and/or character oriented.

MEMORY

One to eight high speed, coincident-current, magnetic core modules may be installed with read access time of 3 microseconds and 6 microsecond memory cycle. There are 4096 49-bit words per module. Each memory module has its own access address register, permitting simultaneous access by processors or input/output control channels.

INPUT/OUTPUT

Bulk Storage

One or two magnetic drums provide fast random access bulk storage. One drum (capacity 32,768 49-bit words) is standard with one processor. A second independent drum may be added to a system. Read-write rate: 8.1 microseconds per character.

Input Output Control Channels

One to 4 independent input/output control channels may be used. Any of these channels may interconnect any memory module and any input/output device. With 4 channels in use, 4 input/output operations may be performed simultaneously with computation.

Input Output Devices

Magnetic Tape Transports: Up to 16 units may be installed. Operating speed: 66,660 or 24,000 characters per second, reading backward or forward at 120 inches per second. Rewind speed: 340 inches per second. Packing density: 555.5 or 200 character frames per inch. Reel capacity: approximately 24 million alphanumeric characters. Dual-gap read-write heads provide longitudinal and vertical parity checking. Data may be either in single-frame alphanumeric or binary form. Tape and format are completely compatible and interchangeable with IBM Model 729—II and 729—IV Magnetic Tape Units.

Printing: One or two 12-position wideline drum printers may be used. Printing rate: 650 lines per minute, double spaced; over 700 lines per minute, single spaced. Each accepts Burroughs Common Language, binary-coded alphanumeric information from any input/output channel into a 120-position buffer. Each has an immediate access print cycle. The print drum contains 64 characters per position. Spacing: 10 characters per inch horizontally; 6 or 8 lines per inch vertically.

Card Readers: A maximum of 2 may be used. 800 per minute or 200 per minute models available. Both are serial card readers with photoelectric sensing. Both models utilize an immediate access clutch and read data in either standard punched card or binary form. Read circuitry is automatically monitored and invalid character recognition is provided.

Card Punch: One parallel card punch may be used. Speed: 100 cards per minute.

Operator-System Communication: One keyboard and one message printer are provided. Keyboard permits entry of control and directive information to the system. Character-at-a-time printer prints instructions to the operator and replies to program status inquiries. Printing rate: 600 characters per minute. All 64 characters of Burroughs Common Language code can be printed.

□ □ □

This announcement is not an offer to sell or a solicitation of an offer to buy any of these securities. The offering is made only by the Offering Circular.

NEW ISSUE

February 6, 1961

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Common Stock
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Circle no. 17 on reader service card.



A single operator, seated before a seven-sided control panel, can handle the telephone orders of up to 3000 customers in the new Direct Order Recording and Invoicing System announced by International Telephone and Telegraph Corporation.

DORIS

A NEW SOUP-TO-DESSERT SYSTEM, designed and tested in England by International Telephone and Telegraph Corporation, is being announced in the United States this month. The system was developed by Creed, an ITT unit, for Shell-Mex and British Petroleum Ltd. to provide a really push-button office for automatic handling of orders and related paperwork.

This system, called DORIS (Direct Order Recording and Invoicing System), handles orders for over six million gallons of assorted petroleum products each month, receiving 85 percent of its orders by telephone. This entire operation is handled by one clerk, from incoming order to invoicing.

The system's core is a seven-sided input console, used by one clerk with a telephone headset to take orders. The inside walls of the cubicle consist of panels of colored pushbuttons, each bearing the name and address of a customer, arranged in alphabetical order. There are 2,880 customer button positions on the one console.

When an order comes in over the phone, the sales clerk sets the system in motion by pressing the appropriate button. Another panel, immediately in front of the clerk, has further pushbuttons whereby he can record all the basic facts about

the order as quickly as given over the phone.

One group of buttons registers any product quantity from one to 9,999 gallons, while another series deals with different types of products — item lines. The day of delivery, packaging instructions and method of

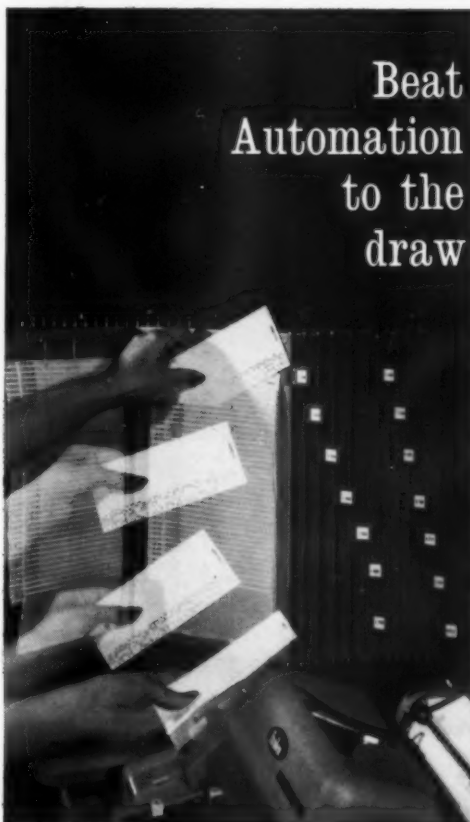
delivery are also recorded by buttons. Any missing data causes buzzers to sound and red lights to flash over the item omitted. When all details are recorded the *end of order* button is pressed; this is the last manual operation required before the system takes over and produces all the necessary sales tickets and invoices automatically.

Paper tape utilized

All basic facts, recorded by the buttons, are punched into paper tape. This takes four seconds. The tape is automatically read and document production begins. The first step is full data on the customer and product, as abbreviations have been recorded.

This information is kept on reels of seven-channel punched tape in several of the new Creed 2000 Tape Stores. For convenience in handling and speed of processing, each customer's information is split into static-address details and terms-of-trade details, stored in separate reels, 500 per reel.

(continued on page 45)



Beat
Automation
to the
draw

Acme Super-Visible System lets operators find...feed...refile cards gunfighter fast!

Super-fast because it's Super-Visible. Keeps the identification edge of every card visible to the operator's eye, in quick-flip hinged aluminum frames. Cards slip out, slip back in a flash, faster than most machines can use them. Guarantees you the full productive power of your investment in office automation. To see how, send coupon today.

ACME VISIBLE

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NEW SERIES

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REFERENCE

GUIDE

PUNCHED CARDS - PUNCHED TAPE - COMPUTERS

► **APPLICATIONS** using punched card and computer equipment.

These especially prepared case histories are classified under the following basic categories:

- Billing (Invoicing)
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- Production Control
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- Premium Accounting
- Operations Research
- Other

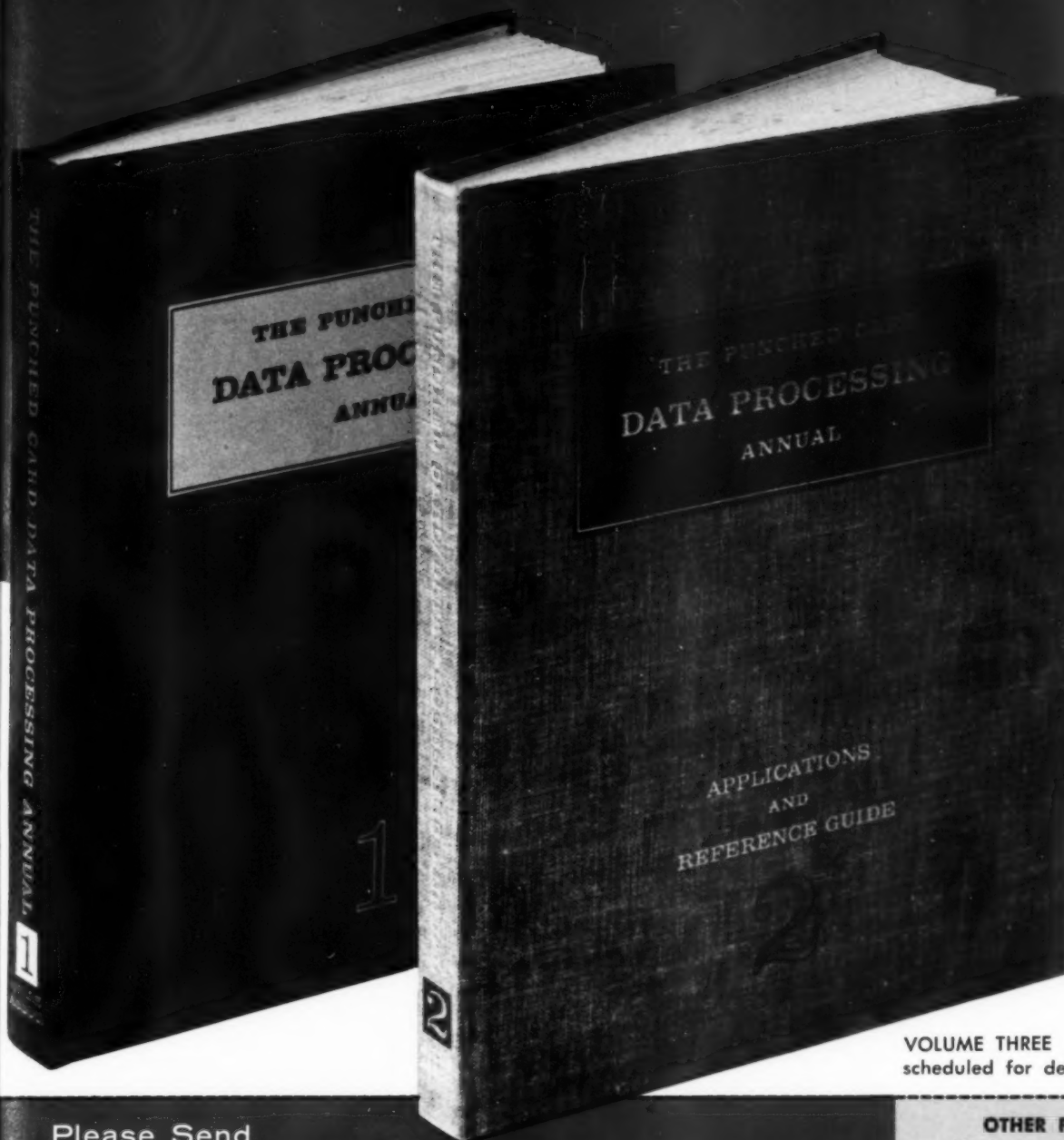
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PEOPLE L A C E S

A. D. EVAN



ARTHUR D. EVAN, who wrote the cover feature on microfilm in the December issue, resigned from the government operation at OTAC to become a management consultant in engineering data processing systems and microfilm. He is now also a contributing editor and columnist for *Reproduction Methods for Business and Industry*.

PHILCO appointed *Nicholas F. Pensiero* as manager of marketing administration for the Computer Division, Government and Industrial Group.

LABORATORY FOR ELECTRONICS, INC. named *George F. George* manager (northeast region) for their Systems Marketing Division.

CONTROL DATA has appointed *Raymond B. Whitney* western region sales manager.

COLLINS RADIO has two new vice presidents: *John B. Tuthill*, finance, and *W. W. Roodhouse*, administration.

AT THOMPSON RAMO WOOLDRIDGE, INC. *James L. Lahey* was appointed to new post of manager, advance technical products; *W. G. Gordon* succeeds him as general manager of Dage Division.

STANDARD REGISTER's treasurer, *Arthur M. Wittman*, was named director of the company. *R. L. Montgomery*, *A. B. Tollini* and *W. F. Griffiths* have become new district managers.

FRIDEN has two new vice presidents — *Dunstan S. Gross*, product planning and *Leland P. Robinson, Jr.*, research and development.

STROMBERG-CARLSON — San Diego has four product managers (new posts): *D. A. Armstrong*, *N. E. Frawley*, *D. B. Stevens*, and *C. E. Murdock*.

E. E. MASURAS



CUMMINS-CHICAGO CORP. appointed *Edward S. Musuras* methods engineer in the Electronic Division.

VITRO LABORATORIES has appointed *Harry J. Johnson, Jr.* as sales engineer for electronic digital instrumentation systems.

A. E. OLFKY



UARCO Incorporated named *Anthony E. Olfky* of Trenton, N. J., as Salesman of the Year.

Richard S. Leghorn, ITEK Corporation's president, will be the key-note at the National Microfilm Association's tenth annual convention on April 4.

MINNEAPOLIS - HONEYWELL has appointed *J. Eric Ashley* as branch manager for their new sales office in Philadelphia.

D. R. MCKAY



AT IBM, the new banking and finance industry manager for the Data Processing Division is *Albert*

H. Pfanschmidt. And *Dean R. McKay*, director of communications for the company, has been elected a vice president.

F. M. HOAR



REMINGTON RAND UNIVAC's new appointments include *Frederick M. Hoar* as the new director of advertising and public relations; *Joseph L. Sturdevant* as manager of commercial sales and *Kenneth L. Snover* as general plant manager of the Ilion-Utica plant.

J. A. BRUSTMAN



RADIO CORPORATION OF AMERICA announces new appointments: *Meade C. Camp*, manager, marketing planning; *H. R. Henken*, advertising and sales promotion manager; *H. N. Morris*, engineering manager for computer plant in Florida; *F. G. Wenger*, production planning manager; *John J. Kramer*, manager, industry group sales for Commercial Systems Department; *J. A. Brustman*, manager, Electronic Systems Engineering of the Advanced Systems Development; *R. K. Lockhart*, head of engineering group for special navy computer project; *Paul W. Thompson*, personnel manager, Palm Beach computer plant; *Joseph Toyzer*, manager of manufacturing engineering, Palm Beach.

BENDIX Corporation's Support Equipment division appointed *Calvin G. Alston* to the new position of western area sales and service representative.



OUTPUTS

ITEMS OF INTEREST
FROM HERE AND THERE

THE B. F. GOODRICH COMPANY has completed an electronic data processing system as part of a national mechanization program to improve *communications and control* over its domestic sales and manufacturing operations. To handle the work there is an IBM 7070 and companion 1401 at corporate headquarters in Akron, Ohio. This system and equipment is the first of its kind for a manufacturing concern, according to Goodrich.

APPLIED DATA RESEARCH, INC., Princeton, New Jersey, is developing a generalized *sort and merge* program for the Remington Rand Univac LARC system. The generator, a complex LARC computer program, will utilize advanced sequencing and selection techniques to increase efficiency and decrease running time. Outstanding features of the program are: flexibility, high sorting speed and large sorting capacity. The program will handle record sizes up to 1,000 words with up to 20 full or partial word keys; it will permit records to be edited, deleted, added, or altered in size during the first or last pass.

IBM ANNOUNCED an employee suggestion award of \$17,685, largest in the 33 year history of the company plan. The winner of the bonus is *Louis C. Russell*, of New Orleans. His idea is a design change for magnetic tape transport armatures which will cut maintenance time from one hour to 15 minutes on each of thousands of tape-handling machines.

PROGRAMMING & SYSTEMS INSTITUTE has opened a branch school in Washington, D. C. at 1404 New York Avenue, N. W. This school is devoted exclusively to *training computer programmers* in complete systems.

AMERICAN MANAGEMENT ASSOCIATION has a new division, Purchasing, which will be concerned with the management of more than \$150 billion worth of purchases made annually by business and industry. Some twenty problem areas of *pur-*

chasing management will be covered during 1961. There will also be a national conference on purchasing and materials managements and a course in purchasing management.

C-E-I-R is now operating a *1,000 word a minute printer*, the first to be available on a service basis, at Arlington, Virginia.

RCA's Electronic Data Processing Division has opened a *sales office* in the State Tower Building in Syracuse, New York, to service upstate New York.

PHILCO CORPORATION has delivered a *Basicpac* Fielddata computer to the U. S. A. Signal Research and Development Laboratory at Ft. Monmouth, N. J.

BURROUGHS CORPORATION has a computer caravan on the road to give bankers and business men in five major financial centers a first hand look at the company's new electronic data processing system, the B251 Visible Records Computer.

■ ■ ■

DATA . . . yours for the asking

OMNITRONICS, INC., a Borg-Warner subsidiary, has prepared a bulletin on a photoelectric tape reader. The reader uses chopped reflected light to achieve reliable tape reading and stability of operation.

Circle no. 70 on reader service card.

VICTOR ADDING MACHINE COMPANY has two pieces of informative literature available: a job evaluation survey form, and a new fast method for job-cost analysis and payroll computations.

Circle no. 71 on reader service card.

BELL TELEPHONE LABORATORIES has published a booklet describing the theory and design of a solid state optical maser. An optical maser is a device which produces a narrow beam of coherent light. All the waves possess a definite

DORIS (continued from page 41)

This information is merged with order data. A series of Model 75 teleprinters and other equipment begins automatically printing out the sales tickets and invoices. A relay operated arithmetic unit performs the calculations involved in preparing the invoice. DORIS produces the sales ticket and invoice within a few seconds and makes a permanent record of the order for all subsequent accounting.

As the sales tickets and invoices are printed, the details are recorded on punched tape for a summary of the day's transaction at the depot. As an identification aid, the serial number of the sales ticket is automatically overprinted, in clear, on the tape, which is then held in a storage rack until delivery to the customer.

When delivery has been made, the tape is fed into a summarizer which adds up the daily issues for each product and sorts the sales ticket details in this sequence on another punched tape.

These tapes are then used for conversion to punched cards for accounting purposes. ■

phase relationship to each other, making it possible to control and use them in communication.

Circle no. 72 on reader service card.

PHOTOMECHANISMS, INC. has published a booklet describing instruments that combine the sensing powers of electronics, optics, and photography used for capture and display of data.

Circle no. 73 on reader service card.

TAB PRODUCTS CO. has a new brochure, *Tabtray*, which describes their truck system for vertically filing data processing cards. This is a mobile system providing a four-shelf truck, plus a tilted double-sided rack, with optional Tabtray truck with tilted base compartments accommodating seven trays on each side.

Circle no. 74 on reader service card.



JOSEPH R. DE PARIS

Thin Film

NOW IT'S NANOSECONDS! Sounds like double-talk or a take-off from Jonathan Winters but in reality this is a new word in the lexicon of data processing. Nanoseconds refer to speeds in terms of *billionths of seconds*, speeds which are made possible by a startling new development for computers — magnetic thin-film memory.

Thin magnetic film computer memory is the fastest form of memory yet developed. It advances access time (*the time required to retrieve information from storage*) to the level of billionths of seconds. Prior to this development, computer speeds were rated in microseconds (*millionths*), or for earlier computers, in milliseconds (*thousandths*). With the internal speeds of computers thus increased, it is obvious that processing time for computer applications will be significantly reduced. In turn, it follows that the speeds of input-output hardware must increase also to achieve a reasonable balance between input-processing-output. Therefore, as this new generation of computers becomes available, look for them to trigger further advances in the input-output area.

Reports indicate that most, if not all, of the major computer manufacturers are working with thin film memory and have developed it to one stage or another in their laboratories. Remington Rand's Univac Division announced the first commercial thin film memory computer, the Univac 1107, several months ago. This computer has a 128 word thin-film memory and ferrite-core memory expandable from 8,192 words to 65,536 words. Delivery in 18 months from contract date is quoted.

According to Rem-Rand, thin film is a ferro-magnetic film (*a few millionths of an inch thick*) made by depositing vapors of iron, nickel, cobalt on a sub-strate such as a thin glass plate. The film has very unusual properties when these deposits are made under controlled conditions.

These properties permit the magnetic state of such a film to be switched in as little as one billionth of a second. Prior memories, such as vacuum tubes, magnetic drums, and core storage, were capable only of much slower speeds. Additionally, these properties allow stored information to be interrogated and read out millions of times without destruction, with less electric power required than for other memories.

Significance of thin film

What is the significance of thin-magnetic film memory for the computer? Rem-Rand is of the opinion that magnetic film elements can be produced which are so small and so fast that computers of smaller size but of much greater capabilities are possible. Since the new memories will be built with non-destructive read-out properties, computers will be more reliable, because the memory cannot be affected by use. Further, since the manufacture of thin film memories is readily adaptable to mass production methods, computers are likely to be produced more economically in the future. In fact, Rem-Rand claims that the Univac 1107 is appreciably lower in cost than less advanced equipment.

Minneapolis-Honeywell has thin magnetic film memory in an advanced state of development, designing such hardware for special purpose air-borne computers. The M-H folks take the position that with the present state of the art only moderate decreases in size of computers will be realized. When micro-miniaturization techniques are coupled with thin film memories, then, in all probability, we will see smaller sized computers and lower costs. Honeywell feels that the next few years will see thin film memories used significantly in military applications. As for business applications and general purpose computers, one of the limiting factors today is economics.

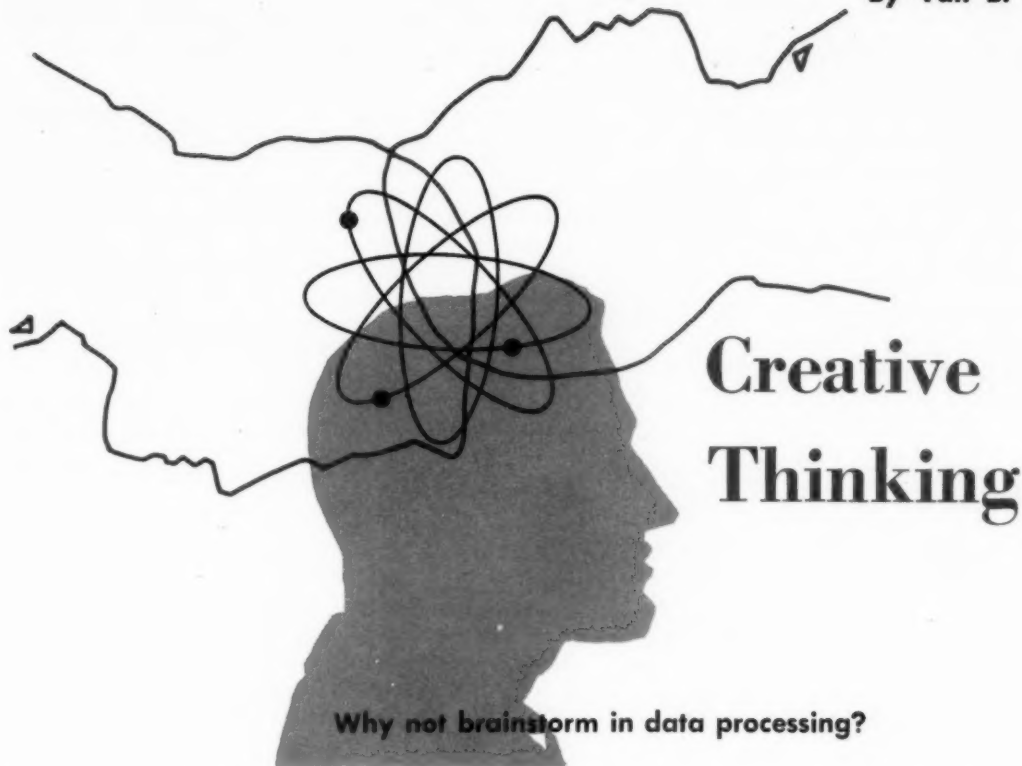
This new memory medium, in this writer's opinion, is one of the truly significant developments in the short history of electronic data processing. It promises to revolutionize an art which has been in a state of revolution for the past fifteen years. The problem of economics is at best a tenuous one. (*When magnetic core storage was first developed, it was a high cost item because of the difficulty of manufacture; yet look how quickly that problem was solved.*)

When the problem of economics is solved, we can expect computers which on the one hand have much greater power and capacity than today's computer, and on the other hand are sized smaller and priced lower. This is a combination that's hard to beat.

An absolutely unconfirmed rumor has it that IBM is readying a vastly improved version of its random access disk storage files . . . Compagnie Des Machines Bull of Paris, manufacturers of punched card equipment, data processing systems, and electronic computers, announces the organization of a United States subsidiary, Bull Corporation of America, with offices in New York City . . . Turnabout: Now IBM has a 90-column card input-output modification for its 1401 computer . . . Uptime Corporation of Broomfield, Colorado has a prototype of its Speedreader 2000. The Speedreader is a card reader capable of reading at speeds of from 400 to 3,000 cards per minute. Reading is accomplished by photo-sensing, providing computers with high speed card input . . . Idea for labelling control panels: Dymo of Berkeley, California markets the M-2 Tapewriter, a hand embosser which you can use to make neat, distinctive labels for your control panels. White letters and numerals are raised up on brightly colored, adhesive backed, pressure-sensitive vinyl tapes. Makes for durable, color coded, easy-to-read labels.

■ ■ ■

By Van B. Thompson



Creative Thinking

Why not brainstorm in data processing?

IN ANY DATA PROCESSING INSTALLATION, from the smallest punched card room to the largest computer complex, the creation of new ideas is an indispensable key to success. Without this key, money spent for machines and personnel all too often is poured down the drain of archaic systems design, and potential benefits are lost. How many times have companies invested heavily in modern, powerful data processing tools, only to apply them to yesterday's methods of doing paperwork? Or, on a more prosaic scale, how many punched card procedures have been "standardized" for years, with the comforting explanation that "They've always been done that way?"

There certainly can be little doubt that creativity is a stock in trade of a good systems man. In fact, it is the major reason for his existence. This was well stated in a doctoral thesis submitted to the Harvard Business School by Phillip H. Thurston. He compares the contributions of operating management with those of the data processing specialist, and has this to say about the latter:

"He is the principal source of new ideas. He develops these because he is in a position and has the time to observe and study current operations and the implications of change, because he is not limited by the need to show a profit in a given operating period but can take a long range point

of view, and, underlying these other reasons, because the principal significance of the specialist's job lies in examining and changing systems. The introduction of new ideas stems also from the specialist's training in new methods and new data handling equipment and from his broad view of systems problems."

Within the installation, creativity need not be limited to the data processing analyst, although he is in the best position to contribute effectively. Line supervisors, and operators, too, can come up with new ideas arising from their spheres of experience. These ideas can contribute toward the goal of reducing costs and increasing profits.

Stimulating of ideas

How can the installation produce more good ideas? Here are some suggestions:

1. Provide contact with others. Someone else may have solved a problem similar to one causing trouble for the installation or system; and the broad approach taken to the problem, if not the details, may be transferrable. Does the company provide subscriptions to data processing publications for key personnel? Does the company underwrite membership in data processing associations? Are opportunities for

growth provided through planned training programs? What about the little guy (*or gal*) in the installation? Are *all* your operators spending at least one week each year in formal training courses?

Here is another idea. Stop to think for a moment how much the people in the installation are being paid. Even the lowly (-paid) key punch operators. Suppose you added to that the price of a magazine subscription for each person. At a subscription price of \$7.50 a year, and based on 2,000 working hours, that would cost three-eighths of a cent an hour per employee. Not much of an increase, is it? Yet the effects, in terms of the application of fresh thinking to *routine* work, and even on morale, can be most worthwhile. Don't forget: your future analysts and line supervisors may well come from today's operating personnel.

2. Provide time. Analysts in particular must be free to read and discuss on the job. Even — you'll pardon the term — to think on the job. What happens in *your* installation when a programmer leans back in his chair and stares off into space?
3. Provide facilities for testing new ideas. Sure, your programmers get to debug their programs on the computer. But can an operator drop in when the data processing room is quiet, to experiment with a new way to wire a control panel?
4. Organizations like Carborundum Company, Massachusetts Institute of Technology, Scott Paper Company, Bristol-Myers Company, and RCA's Television Division have applied the much talked-about tool of *brainstorming* to problems in science, engineering, purchasing, marketing, and the like. This writer has never heard of its application to data processing problems — systems design, scheduling, programming, personnel administration — but there seems to be no reason why it cannot be. Stripped to its essentials, the brainstorming technique, whether used individually or in a group, is simply the suspension of critical judgment for a short period of time while the imagination is left free to come up with even the wildest ideas on the subject in question. Ample literature about this proven but simple technique is available from the Creative Education Foundation, 1614 Rand Building, Buffalo 3, New York. But don't send for it if you are against enjoying your work, because in addition to being highly productive, brainstorming is fun.

Yes, creative thinking is the life-blood of a successful data processing installation.

Transfusion, anyone? ■

SEEN IN PRINT

THE ADP EXPERIENCE OF LOCAL AND STATE GOVERNMENTS, an American Report by John Diebold & Associates, Automatic Data Processing, London, November, 1960.

A recent census in the field of local government showed about 130 computers installed and an equal or slightly higher number on order. In the next year and a half there should be a 100 percent increase in applications in the state and local government area. These machines are increasingly used for data processing instead of engineering, which occupied the first installations in highway departments. Of 128 installations, 99 are in state governments, 13 in cities, and 16 in county governments. Most are small and medium scale computers.

DATA PROCESSING & COMPANY ORGANIZATION by E. Frederick Halstead, *Journal of Machine Accounting*, December, 1960.

The place of the machine facility in company organization is going to assume more importance than it ever has in the past. Although there are going to be some major organization changes as a result of improvements in data processing techniques, the facility is apt to remain as part of the comptroller's department. There is need for those in the data processing end to explain these functions to other sections of their company. ■

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BOOK SHELF

THE CRISIS WE FACE: AUTOMATION AND THE COLD WAR, by George Steele and Paul Kircher, McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y., 1960, 220 pages, \$4.95.

The authors challenge the quality of our military defense and our economic position; they call for more effective automation and electronic computers.

They discuss the probable effect of radio-activity, resulting from a hydrogen bomb burst, on electronic systems in bombers, missiles and on CONELRAD. Their feeling is that these systems would fail to work under such conditions. Problems of management and government, such as complex organizational structures, and the multiple committees in the Department of Defense, are deplored, though the fault is laid to management, not engineers.

Included are suggested programs to help executives perform more effectively. It calls for standardized system components, simpler computers and automation, and improved research, stressing the need for better educational programs in management and engineering.

The book gives an understanding of new basic technical design concepts, a new approach to the organization of large groups, and insights into other areas concerned with survival of our country.

AUTOMATION AND SOCIETY, edited by Howard Boone Jacobson and Joseph S. Roucek, Philosophical Library, 15 E. 40th St., New York 16, N. Y., 550 pages, \$10.00.

This thick tome is a collection of case studies of many companies. It covers both factory automation and automation in the office, with sidelights on the effects of automating on employees and labor in general.

Topics cover automation in: manufacturing, automotive industry, metal working industries, electronics industry, communication machine manufacturing, railroads, post office; and in the office, discusses the teaching machines, automation and the accountant, automation in data processing for business — small, medium and large. Two chapters cover the Bell system.

Another section covers the responsibilities of automation: automation, employment and economic stability; quality in an automated economy; automation and education; automation's impact on capital and labor markets; on leisure; as a management problem; political aspects; personnel adjustments; public administration; and social stratification. The authors conclude with a glance at the technological and economic problems of automation in the U.S.S.R.

GLOSSARY OF TERMS IN COMPUTERS AND DATA PROCESSING by Edmund C. Berkeley and Linda L. Lovett, Berkeley Enterprises, Inc., 815 Washington St., Newtonville, Mass., 1960, 90 pages, \$3.95.

The fifth edition of the *Computers and Automation Glossary*, this volume contains almost 900 terms, defined more clearly and fully than usually noted in most attempts at glossaries in the field. The authors say:

"In this glossary, we have sought to define with particular care the special terms for key ideas. We have tried to define them fully, with sufficient comment and illustrations . . . In addition to this aim, we have sought to express the definitions for all terms in words that would be clear to a person relatively new to the field, one who did not already have some familiarity with the term he looked up. The main purpose of this glossary, in fact, is to give definitions that can be understood by the user."

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editorial

IT IS CURRENTLY FASHIONABLE in data processing consulting circles to de-emphasize technical competence. Many of the major consulting firms focus upon "presenting the top management view" and upon consulting "at the policy level."

Contrary to this trend, we regard superior technical competence as one of the primary assets of the successful consultant in our field.

Technical competence, however, should not be the *sole* ingredient of professional service, but we do consider it an inseparable part. To illustrate, one would expect a surgeon to be highly skilled at tying a knot in a small space — this is a technical skill essential to his service — but expertness in tying knots does not qualify one as a surgeon.

Whenever this topic is discussed, it reminds us of the following story, printed by permission of the copyright owner — Hume Associates, 19 East 53rd Street, New York 22, New York.

In ancient days a certain venerable Chinese gentleman acquired a reputation for learning and wisdom, and his advice was greatly valued.

A prominent merchant sought counsel regarding his accounting department. He employed five clerks, each equipped with an abacus, to perform all his computing. Recently the merchant had experienced a growth in volume, and requested advice before taking the obvious step of recruiting an additional abacus operator.

The Chinese consultant investigated the situation and then contemplated for several days. Finally he submitted his report.

"It is not necessary for you to go to the expense of hiring additional personnel. If each abacus operator had six fingers on each hand instead of five, he could readily increase his productivity by 20%. Accordingly, the recommended solution is that henceforth you hire only twelve fingered men, and that you take immediate action to see that each member of your present staff grows an additional finger on each hand."

The merchant was delighted at the prospect of solving his problem without increased overhead. He began to plan immediate implementation of the recommendations, and then paused.

"Oh Learned Sir," said he, "Your solution to my problem appeals to me greatly, and I intend to put it into effect immediately. But, how shall I go about obtaining twelve fingered people?"

"An excellent question," replied the consultant, "however, I concern myself only with policy level recommendations. It is up to you to work out the technical details." ■

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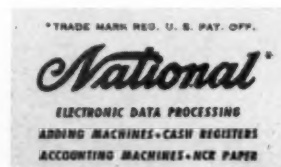
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